02:00:00

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

- - -

UNITED STATES OF AMERICA,	:	CASE NO. 1:18-cr-0043
Plaintiff,	:	
vs.	:	JURY TRIAL
YANJUN XU, also known as XU YANJUN, also known as QU HUI, also known as ZHANG HUI,	:	28th of OCTOBER, 2021 9:30 A.M.
Defendant.	:	VOLUME 9

- - -

TRANSCRIPT OF PROCEEDINGS
BEFORE THE HONORABLE TIMOTHY S. BLACK, JUDGE
UNITED STATES DISTRICT JUDGE

- - -

APPEARANCES:

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Robin Murphy, Interpreter
Yanjun Xu, Defendant

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Courtroom Deputy: Bill Miller

Stenographer: Mary Schweinhagen, RPR, RMR, RDR, CRR
United States District Court
200 West Second Street, Room 910
Dayton, Ohio 45402

Proceedings reported by mechanical stenography, transcript produced by computer.

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INDEX OF WITNESSES

THURSDAY, OCTOBER 28, 2021

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P-R-O-C-E-E-D-I-N-G-S 9:29 A.M.

(In open court outside the presence of the jury.)

09:29:29 THE COURT: Good morning. We're here in the open
09:29:31 courtroom, 9:30, outside the presence of the jury.
09:29:34 The government team is here. Defense team is here.
09:29:38 Defendant and the interpreters.
09:29:43 We're outside the presence of the jury.
09:29:49 I want to address the government's request for a curative
09:29:54 instruction. I acknowledge that we received the email
09:30:00 statements from both parties last night. The Court has
09:30:04 considered the government's request and finds that defense
09:30:08 counsel's references to trade secrets during Mr. G-A-O's [sic]
09:30:14 cross-examination were not inappropriate.
09:30:18 Specifically, defendant is charged with conspiracy and
09:30:20 attempt to commit economic espionage and conspiracy and
09:30:26 attempt to commit trade secret theft. Each of these four
09:30:31 counts hinges on whether the defendant agreed to obtain or
09:30:37 attempted to obtain information he believed to be a trade
09:30:41 secret, not whether the information sought actually was a
09:30:44 trade secret.
09:30:46 Therefore, when defense counsel cross-examines an agent,
09:30:53 for instance, and asks whether trade secrets were actually
09:30:56 stolen, the answer to that question is irrelevant. And any
09:30:59 implication by the defense that there is no crime if the
09:31:03 information sought was not a trade secret is inaccurate. This

is because, again, the question is not whether an actual trade secret existed or was stolen, but rather whether defendant believed the information he was attempting to obtain was a trade secret.

Because defendant's intent is at the core of the offenses here, it stands to reason that defense counsel needs to be permitted to establish, if able, the defendant did not believe any of the information he sought was a trade secret. However, demonstrating a lack of intent is not a simple task, and indeed one of the few ways to do so here would be to show that none of the information defendant or any alleged co-conspirator asked for was a trade secret.

Perhaps the more often defendant sought information that was not a trade secret, the more reasonable it might become for a jury to conclude that defendant never intended to steal trade secrets at all. This is, of course, countered by the government's evidence relating inter alia to the secrecy of the operations, et cetera. But that's a test for the jury, not the Court.

All of this is not to say that the defense has free range to imply that the existence of a trade secret is required for conviction. And, of course, the Court will instruct the jury after the close of evidence as to what the law is. But for now, having defense counsel merely inquire as to whether defendant ever actually asked for a trade secret is not

inappropriate. It's a fine line. But should the defense -- one, the Court must allow the defendant to walk in the interest of justice. Should the defense cross the line, the Court will provide a curative instruction to the jury. But the Court declines to do so at this time. That's the Court's ruling.

Are we prepared to get the jury or are there other matters that require my attention outside their presence? Anything like that from the government?

MS. GLATFELTER: Your Honor, just a point of clarification on the Court's ruling. I understand what the Court has said and respect that.

My question is the way the term has been used. "Trade secret" is a specifically defined term in 1839, which both parties have acknowledged. So the term "trade secret" includes all sorts of different types of information that are listed in the definition. And I'd request rather than ask the witness whether or not the witness believes a trade secret was asked for or taken or attempted to be taken, they ask for these types of specific information. Because the subjective belief of the witness in terms of what constitutes a trade secret is irrelevant.

But I understand the Court's ruling and appreciate that, and we're not contesting that. We're just asking for a clarification about the type of question that can be asked.

THE COURT: I'm not inclined to instruct the jury at this point. I hear what you're saying. Let me think about it. We'll see how we can implement it.

MS. GLATFELTER: Thank you, Your Honor. And just for clarification, I'm not asking that the Court be instructed but merely outside the presence of the jury limiting the type of questions where the witness is not asked did he ask for a trade secret but is asked about the specific types of categories that constitute a trade secret in the definition of a trade secret.

THE COURT: And I'm not inclined to get into it at this time.

MS. GLATFELTER: Okay.

THE COURT: I think it's fair, but I need to think it through.

MS. GLATFELTER: Thank you, Your Honor.

THE COURT: Are we ready for the jury from the government's perspective?

MR. MANGAN: Yes, Your Honor.

THE COURT: Are we ready for the jury from the defendant's perspective?

MR. MIEDEL: Yes, Your Honor.

THE COURT: Let's call for the jury.

It will take a few moments. They are upstairs rather than in the elevator.

09:35:42 On the record, for the benefit of counsel, we have a
09:35:46 courtroom deputy substitution. Bill Miller has been working
09:35:52 for the court since a child. He's stepping in today, and it's
09:35:55 a credit to him, and you will be kind and professional with
09:35:59 him.
09:36:40 THE COURTROOM DEPUTY: All rise for the jury.
09:36:42 (Jury in at 9:36 a.m.)
09:37:15 THE COURT: You may all be seated. The 15 members
09:37:18 of the jury have rejoined us at 9:37, pursuant to government
09:37:27 work. Thank you for your patience and continued attention.
09:37:33 We'll proceed to the hearing and hear testimony. Who
09:37:35 does the government call at this time?
09:37:36 MR. MANGAN: Your Honor, the government calls Jason
09:37:38 Wang.
09:37:41 THE COURT: If that gentleman would be willing to
09:37:44 approach.
09:37:45 I will put you in the witness stand over here. You walk
09:37:48 around the Plexiglas. You are doing fine. And if you would
09:37:51 pause where you are, I am going to ask you to take the oath to
09:37:54 tell the truth.
09:37:55 Would you raise your right hand. Do you solemnly swear
09:37:58 or affirm that your testimony today will be the truth, subject
09:38:01 to the penalty of perjury?
09:38:03 THE WITNESS: I do.
09:38:03 **JASON WANG, PLAINTIFF WITNESS, SWORN**

09:38:03 THE COURT: Very well. You can get seated on the witness stand. We need you close to the microphone. Any exhibits will be on the screen. Some may be on paper.

09:38:20 THE WITNESS: Thank you.

09:38:21 THE COURT: The government has a chance to begin with questions of you.

09:38:24 Mr. Mangan, you may proceed.

09:38:27 MR. MANGAN: Thank you, Your Honor.

09:38:29 **DIRECT EXAMINATION**

09:38:29 BY MR. MANGAN:

09:38:29 **Q.** Good morning, sir.

09:38:30 **A.** Morning.

09:38:31 **Q.** Tim Mangan on behalf of the United States.

09:38:34 Can you state your full name and spell your last name, please.

09:38:37 **A.** My name's Jason Wang. Last name's W-A-N-G.

09:38:42 **Q.** All right. And where do you work, Mr. Wang?

09:38:45 **A.** I work for FBI.

09:38:47 **Q.** When did you first start working for the FBI?

09:38:50 **A.** 2013 as a contractor.

09:38:53 **Q.** All right. At some point did you become a full-time employee?

09:38:56 **A.** I become full-time employee in 2016.

09:38:59 **Q.** And what is your job title with the FBI?

09:39:02 **A.** It's language specialist.

09:39:08 **Q.** And how long have you worked as a language specialist?

09:39:10 **A.** Including the contract years, eight years.

09:39:12 **Q.** All right. And as a language specialist, what languages do you speak?

09:39:15

09:39:16 **A.** I speak Chinese Mandarin.

09:39:19 **Q.** As a language specialist for the FBI, what are your duties?

09:39:23

09:39:23 **A.** My duty's to translate the materials the case agent acquired and provide translation services.

09:39:30

09:39:40 **Q.** And as part of your job, do you receive ongoing training from the FBI?

09:39:42

09:39:43 **A.** I do.

09:39:43 **Q.** And do you go through ongoing testing as well?

09:39:46 **A.** There is no ongoing testing. Just Chinese.

09:39:53 **Q.** Okay. Is there something called a verbatim translator?

09:39:58 **A.** Yes.

09:39:58 **Q.** All right. And are you certified as being able to do verbatim translating for the FBI?

09:40:03

09:40:05 **A.** Yes.

09:40:06 **Q.** All right. As part of your role, do you supervise other translators? Or review their work?

09:40:11

09:40:16 **A.** Yes.

09:40:17 **Q.** Okay. Let's turn to your involvement in this case. Can you describe your involvement in this particular case?

09:40:21

09:40:24 **A.** In this case, I translate the materials the case agent

acquired, and I also provide other translation services to him, including verbatims or transcriptions for case agents.

Q. All right. As part of the investigation, were you aware of the part of the investigation involving communications between the GE employee and the defendant?

A. Yes.

Q. All right. And were you involved in translating those communications?

A. Yes.

Q. Did that include emails?

A. Yes.

Q. Did it also include something called WeChat?

A. Yes.

Q. Are you familiar with the WeChat app?

A. Yes.

Q. Did you translate any incoming messages?

A. Yes.

Q. What about outgoing messages?

A. Yes.

Q. You were also involved in translating those?

A. Yes.

Q. Okay. And in doing so, who was the special agent that you worked with?

A. Special Agent Bradley Hull.

Q. Now, at some point did the case agents travel to Belgium

09:41:48 in the spring of 2018?
09:41:49 **A.** Yes.
09:41:50 **Q.** And did you go with them on that trip?
09:41:53 **A.** Yes.
09:41:53 **Q.** And were you with the GE employee as well?
09:41:57 **A.** Yes.
09:41:58 **Q.** Okay. What was your role during that trip?
09:42:04 **A.** I help communicating -- I help translating any
09:42:09 communications between the GE employee and the Mr. Qu.
09:42:20 **Q.** Is that spelled X-U?
09:42:21 **A.** Q-U.
09:42:24 **Q.** Thank you. While in Belgium, do you recall phone
09:42:28 conversations that occurred between the GE Aviation employee
09:42:32 and Mr. Qu?
09:42:35 **A.** Yes.
09:42:36 MR. MANGAN: Your Honor, if we may, we'd like to
09:42:38 publish Exhibit 77c, which has been admitted.
09:42:43 THE COURT: Very well. You may show 77c to all.
09:42:49 MR. MANGAN: If we could turn to page 5.
09:42:49 BY MR. MANGAN:
09:42:57 **Q.** Looking at this, Mr. Wang, do you see a WeChat call on
09:43:02 March 30, 2018?
09:43:03 **A.** Yes.
09:43:06 MR. MANGAN: All right. I'm sorry. Further up at
09:43:11 the top there. Thank you.

BY MR. MANGAN:

Q. There's one call, and then immediately thereafter there appears to be a second call at 7:02 a.m. Do you see that?

A. Yes.

Q. Were you present for these calls?

A. I was.

Q. And who were you with at the time?

A. I was with the GE employee and the -- another special agent.

Q. Were you able to listen to the conversations?

A. Yes.

Q. In what language were the conversations spoken?

A. Chinese Mandarin.

Q. And did you provide translations during that call for the agents?

A. Yes.

Q. All right. And were you able to explain what was being said during those calls?

A. Yes.

Q. All right. Do you recall this first set of calls that occurred on March 30, 2018?

A. Yes.

Q. All right. Can you explain to us what was said during those calls?

A. Yes. So on that day Mr. Qu calls the GE employee and

he -- he asked the GE employee to travel and meet him in either France or Amsterdam.

Mr. Qu said those two locations are the only options.

And the GE employee replied by saying he needs to check his schedule. He is not sure if he is on a business trip.

So that comes back as just being back and forth. Mr. Qu kept asking the GE employee to travel with him, but the GE employee kept saying he just can't make it. He is not sure about his schedule.

Q. Is that the summary of what happened during those phone calls?

A. Yes.

Q. All right. If we could scroll down, were there a couple more WeChats -- well, do you see the WeChat from Qu Hui saying, "Teacher, is the schedule finalized?"

A. Yes.

Q. All right. And then after that, a little bit later, was there a second set of calls?

A. Yes.

Q. All right. And who participated in those phone calls?

A. It was Special Agent Bradley Hull and another special agent and the GE employee and me.

Q. Okay. Who actually was talking during the phone calls?

A. The GE employee.

Q. Okay. And who was on the other side?

A. Mr. Qu.

THE COURT: How do you spell that name?

THE WITNESS: Q-U.

THE COURT: Thank you.

BY MR. MANGAN:

Q. And by the way, was this on like a speaker phone so you could hear it?

A. Yes, that was on a speaker phone.

Q. Okay. And, again, what language was this phone call in?

A. Was in Chinese Mandarin.

Q. Do you recall what was discussed during this second set of phone calls on March 30th?

A. Yes.

Q. Can you explain to the jury what was discussed during the second set of phone calls?

A. Yes. So the GE employee started by saying he just can't make it to either France or Amsterdam because he is on a tight schedule. He said -- the GE employee asked Mr. Qu to come to France or Belgium to meet him there.

Mr. Qu said it's very difficult for him to do so because, one, he's already out of country; two, he, per Chinese government's policy, an employee is to receive approval before traveling to another country. And if he, Mr. Qu, travels to another country without prior approval, it will be a serious misconduct.

09:47:12 Mr. Qu then said -- then told the GE employee instead
09:47:22 of going to meeting in France or Amsterdam, he advise the GE
09:47:33 employee to travel back to China. Mr. Qu said he can do any
09:47:37 time. He can meet him any time in June, July, or August.
09:47:43 And Mr. Qu said he will cover all the costs.
09:47:47 Again, the GE employee say he needs to -- he's not sure
09:47:51 about his schedule.
09:47:59 And toward the end of the call -- at one point, Mr. Qu
09:48:08 indicated this trip is based on this meeting and he really
09:48:17 wants to meet with Mr. -- he really wants to meet with the
09:48:23 GE employee.
09:48:25 Toward the end of the call, Qu suggested that how about
09:48:32 they could meet at the boarder between Brussels and
09:48:35 Amsterdam. Mr. Qu said it will be very hard for him to
09:48:42 report if they don't meet this time.
09:48:44 And that's the end of the second call.
09:48:48 **Q.** All right. Thank you. We just talked about the two
09:48:55 calls on March 30th. Were there phone calls on March 31st,
09:49:00 the next day?
09:49:01 **A.** Yes.
09:49:03 MR. MANGAN: If we could turn to page 8 of Exhibit
09:49:06 77c, please.
09:49:06 BY MR. MANGAN:
09:49:12 **Q.** Do you see another phone call indicated on the page?
09:49:15 **A.** Yes.

09:49:17 **Q.** All right. And by the way, can you make phone calls
09:49:20 through the WeChat app?
09:49:22 **A.** Yes, there is a voice chat function there.
09:49:25 **Q.** All right. Do you recall what was discussed during this
09:49:29 phone call?
09:49:30 **A.** Yes.
09:49:34 **Q.** All right. And was this again between the GE employee
09:49:37 and Mr. Qu?
09:49:39 **A.** Yes.
09:49:39 **Q.** And was it again in Chinese?
09:49:41 **A.** Yes.
09:49:42 **Q.** All right. Can you explain to the jury what you recall
09:49:47 about the phone call on March 31st?
09:49:48 **A.** Yes. So in this phone call, Mr. Qu start by saying he
09:49:55 is already in Amsterdam. He will talk to China to ask for
09:50:02 approval. Then he proceeds to -- to -- to talk with the GE
09:50:09 employee when and where they are going to meet the next day.
09:50:17 Qu, Mr. Qu say that he can meet around 3 p.m., and
09:50:22 Mr. Qu instructed the GE employee to find a nearby coffee
09:50:27 shop so they can avoid being seen by GE employee colleagues.
09:50:34 **Q.** And was this discussion about them meeting in Brussels?
09:50:37 **A.** In Brussels.
09:50:38 **Q.** Okay. All right. Thank you.
09:50:42 MR. MANGAN: We can take that exhibit down, please.
09:50:44 Thank you.

BY MR. MANGAN:

Q. Aside from the calls in Belgium, have you heard the defendant's voice on other occasions?

A. Yes.

Q. When he was brought from Belgium to the United States, were you present?

A. Yes.

Q. So to the extent he said anything during that travel, were you able to hear his voice?

A. I was able to hear his voice.

Q. Okay. In addition, while he's been in custody in the U.S., have you been able to listen to any recordings of him?

A. Yes.

Q. All right. Do you also recall -- do you recall a phone recording between the GE employee and Mr. Qu that was recorded by Agent Hull before the Brussels trip?

A. Yes.

Q. And did you listen to that recording?

A. Yes.

Q. Were you involved in reviewing that translation?

A. Yes.

Q. All right. From these various interactions, have you become familiar with listening to Mr. Qu's voice?

A. Yes.

Q. Okay. I want to ask you about some recording, a

recording pulled from the iCloud.

Are you familiar with a recording that the agents found from October of 2017?

A. Yes.

Q. All right. And were you involved in translating that recording?

A. Yes.

Q. Was this a recording -- as far as the substance, did this pertain to a particular individual who went over for a presentation?

A. Yes.

Q. And who was that individual?

A. Mr. Gao.

Q. Mr. Gao?

A. Yes.

MR. MANGAN: Your Honor, if I could have the witness take a look at Exhibit 86b, which has already been admitted.

BY MR. MANGAN:

Q. Do you see that in the binder there, sir?

A. Yes.

Q. Was a transcript prepared for that recording?

A. Can you rephrase that?

Q. Sure. The audio recording that you talked about of Mr. Gao, was that translated?

A. Yes.

09:53:11 **Q.** All right. And were you involved in that translation?
09:53:14 **A.** Yes.
09:53:15 **Q.** And was a written transcript prepared?
09:53:17 **A.** Yes.
09:53:19 **Q.** Okay. Did you hear the defendant's voice in that
09:53:23 recording?
09:53:23 **A.** Yes.
09:53:24 **Q.** And is that indicated on the transcripts? In other
09:53:34 words --
09:53:34 **A.** Yes, yes.
09:53:35 **Q.** Where Mr. Qu speaks, does it say "Mr. Qu"?
09:53:40 **A.** Yes.
09:53:40 **Q.** Generally for the recording, was there a period of time
09:53:45 when Mr. Gao was present in the recording?
09:53:49 **A.** Yes.
09:53:49 **Q.** All right. And then is there a period of time when --
09:53:52 after he had left?
09:53:53 **A.** Yes.
09:53:55 **Q.** After Mr. Gao had left?
09:53:56 **A.** Yes.
09:53:57 **Q.** Okay. I'd like you to turn to Exhibit 86c.
09:54:03 MR. MANGAN: Your Honor, if we could publish that
09:54:05 transcript.
09:54:06 THE COURT: It's been admitted?
09:54:08 MR. MANGAN: It has, Your Honor.

09:54:09 THE COURT: Yes, you may show it to the jury and to
09:54:12 all.
09:54:18 BY MR. MANGAN:
09:54:20 **Q.** Mr. Wang, is this the -- starting on page 1 of 86c, is
09:54:24 this the break in the recording where Mr. Gao leaves the
09:54:33 meeting?
09:54:33 **A.** Yes.
09:54:34 **Q.** All right. And then does the recording continue on after
09:54:36 he leaves?
09:54:36 **A.** Yes.
09:54:38 **Q.** All right. And does the defendant speak during that
09:54:41 ongoing meeting?
09:54:42 **A.** Yes.
09:54:42 **Q.** All right. I'd like to walk through some portions of
09:54:47 this transcript with you if I may.
09:54:52 MR. MANGAN: If we could start down at the bottom of
09:54:54 that page 1. Thank you.
09:54:54 BY MR. MANGAN:
09:54:58 **Q.** This section of the meeting -- - I realize this is --
09:55:01 this transcript is over 40 pages, correct?
09:55:04 **A.** Yes.
09:55:05 **Q.** I'd like to read some sections of this with you. As we
09:55:10 go through it, would it be okay if I read the parts for
09:55:18 Mr. Xu, all right, and if you could read the parts for where
09:55:20 it says "UM." Would that be okay?

09:55:24 **A.** Yes.

09:55:24 **Q.** All right. And where it says "UM," what does that indicate?

09:55:27

09:55:28 **A.** Unknown male.

09:55:29 **Q.** Unknown male?

09:55:30 **A.** Yes.

09:55:31 **Q.** Okay. Let's begin at the bottom of page 1 where it states, "Our discussion this afternoon," okay?

09:55:37

09:55:41 **A.** Okay.

09:55:41 **Q.** I'll read Mr. Xu and you can read the other individual's.

09:55:44 **A.** Okay.

09:55:45 **Q.** Thank you.

09:55:47 "Our discussion this afternoon -- because -- this -- due to the rush this afternoon and you all are in a rush, originally I thought you would stay here -- here longer."

09:55:51

09:55:54

09:55:57 **A.** "Hmm."

09:55:59 **Q.** "Thinking -- I'm thinking this -- er -- our expert -- our next step this collaboration has several different levels."

09:56:04

09:56:06 **A.** "Um-hmm."

09:56:07 **Q.** "The first level --"

09:56:09 **A.** "Hmm."

09:56:11 **Q.** "-- is currently our -- from our ministry, services to the several research institutes."

09:56:16

09:56:18 **A.** "Um-hmm."

09:56:19 **Q.** "We have a few levels."

09:56:20 **A.** "Hmm."

09:56:21 **Q.** We have a few levels. The first level is -- the highest level is our experts can participate directly to -- if this expert's ranking is high --"

09:56:30 **A.** "Um-hmm."

09:56:33 **Q.** "-- in addition to being reliable, the expert can participate in some -- some program design."

09:56:33 **A.** "Um-hmm."

09:56:38 **Q.** "Such as program validation --"

09:56:39 **A.** "Um-hmm."

09:56:42 **Q.** "-- because he said earlier he participated in all processes involving the engine control --"

09:56:42 **A.** "Um-hmm."

09:56:45 **Q.** "-- project or design, project -- validation -- whether he can participate or not."

09:56:48 **A.** "Um-hmm."

09:56:53 **Q.** "-- these types of things -- in terms of classified information security -- these types of things associated with some of our institutions -- our state's own classified information."

09:56:54 **A.** "Right."

09:57:00 **Q.** "This type of things for sure -- our ministry would want -- through the group, the signing of nondisclosure agreements --"

09:57:05 **A.** "Um-hmm."

09:57:16 MR. MANGAN: If we could turn to the next. Thank you.

BY MR. MANGAN:

Q. "-- through the enterprises or signing of a formal collaboration agreements --"

A. "Um-hmm."

Q. "-- this is our highest level of collaboration."

A. "Highest level."

Q. "Right. Another words, our experts abroad. Due to the fact that they can't -- some experts would quit their jobs abroad and come back directly, right?"

A. "Um-hmm."

Q. "But -- but that's impossible for a majority of them. They cannot do that. They can only use their vacation time or give you half a month --"

A. "Um-hmm."

Q. "-- they would ask for specific programs to be presented directly and will review it and answer whatever specific questions."

A. "Um-hmm."

Q. "This is quite -- the second level is to present program, every program, everything we have, but this is not convenient, right?"

A. "Um-hmm."

Q. "If we have specific questions --"

09:58:06 **A.** "Um-hmm."

09:58:07 **Q.** "-- we can ask directly. For instance, we have some -- some -- we have some, encountered some problems on certain models --"

09:58:16 **A.** "Um-hmm."

09:58:17 **Q.** "-- we can directly -- directly present those questions --'

09:58:19 **A.** "Um-hmm."

09:58:21 **Q.** "-- present it in a very specific fashion. I saw it afternoon that you are not too familiar with the expert, right?"

09:58:28 **A.** "Um hmm."

09:58:31 **Q.** "You can't -- you can't say too much on certain things. The third -- the third is -- er -- the third level -- our experts, that's you -- if you feel that our experts can do something in any way or we can ask them to provide some information directly."

09:58:49 **A.** "Um-hmm."

09:58:49 **Q.** "This is -- this -- this is something we have frequently done in the past --"

09:58:54 **A.** "Um-hmm."

09:58:55 **Q.** "-- directly using information as our service. But this brings some -- brings some issues. For instance, the volume of information is large."

09:59:04 **A.** "Um-hmm."

09:59:04 **Q.** "Maybe -- another words -- currently our security with information has become more strict."

09:59:10 **A.** "Um-hmm."

09:59:11 **Q.** "And a lot of time may be spent on digesting the information, right? In addition, as experts abroad, it would be very difficult for them to directly take materials, large batches of materials from aboard.

09:59:25 **A.** "Um-hmm."

09:59:26 **Q.** "Due to the fact that their companies' security is tight. The risk they bear is very --"

09:59:33 **A.** "He is at GE currently?"

09:59:36 **Q.** "Yes, he is at -- oh, no."

09:59:38 **A.** "Allison."

09:59:40 **Q.** "Allison."

09:59:43 "At Honeywell."

09:59:43 **A.** "Oh, still Honeywell currently."

09:59:46 **Q.** "At Honeywell doing engine control."

09:59:49 **A.** "Um-hmm."

09:59:49 **Q.** "So maybe we'll have him take these information directly. Because he said that -- that Allison has bankrupt he said."

09:59:56 **A.** "Bought out."

09:59:58 **Q.** "Got bought out. Already bankrupt and then bought out -- bought out."

10:00:02 **A.** "Um-hmm."

10:00:03 **Q.** "Er -- this -- is one aspect, obtain information. And

10:00:07

10:00:10 then another thing he talked about, he can also contribute
10:00:13 other things for our institution. For us -- for instance, to
10:00:18 a certain degree or his lack of ability of -- maybe -- he is
10:00:22 not a comprehensive talent --"
10:00:24 **A.** "Right."
10:00:24 **Q.** -- so cannot accomplish. He can introduce other experts
10:00:28 to us."
10:00:31 "Or give us -- right? -- introduce such and such --
10:00:34 other -- right -- other teams -- to provide service to us.
10:00:38 That's the main four or five aspects or levels. After all, I
10:00:43 think the main thing is if it is convenient for everyone and
10:00:46 logical to everyone. My take it is -- to check if a common
10:00:51 ground can be reached for the collaboration. Actually, you
10:00:54 all saw the expert earlier -- basically -- basically -- as
10:00:58 long as he know, he is willing to talk about it?
10:01:01 **A.** "Um-hmm."
10:01:02 **Q.** "He has been doing T800 for a long time --"
10:01:05 **A.** "Right."
10:01:07 **Q.** "-- for rather a long time. So he may not recall some of
10:01:11 the parameters and some of the things. But basically as long
10:01:14 as he can remember --"
10:01:15 **A.** "Um-hmm."
10:01:16 **Q.** "-- he will talk about -- will talk about it. In
10:01:19 addition, this person -- this person is more reliable --"
10:01:22 **A.** "Um-hmm."

10:01:23 **Q.** "-- person. This person is not -- not selfish or
10:01:28 whatnot."
10:01:28 **A.** "As for exchange aspect, I feel it's quite smooth."
10:01:34 **Q.** "Hmm, quite smooth. Currently, the next part of work --
10:01:39 our work with him cannot be only staying at -- this kind of
10:01:42 sample exchange for sure."
10:01:44 "We are hoping -- for direct services on model and
10:01:47 project in our institution or to provide greater support.
10:01:50 This -- this -- right now -- can you please check what is
10:01:54 needed from us for the next step in what direction, in order
10:01:57 to do more?
10:01:58 **A.** "Um-hmm."
10:01:59 **Q.** "Because right now -- currently -- he have provided us
10:02:03 mainly with this T800 software testing aspect -- he has --
10:02:08 given us some things."
10:02:09 **A.** Um-hmm.
10:02:10 **Q.** "But we -- we'll see -- the next step -- what do we --
10:02:15 what do we still need in whichever aspects. Can you make some
10:02:19 suggestions to us?"
10:02:22 **A.** "Let's go one at a time among the three of us to talk
10:02:25 about our feelings, okay?"
10:02:27 **Q.** "Yes."
10:02:29 Why don't we stop there, and we will forward a little bit
10:02:32 from there, Mr. Wang.
10:02:35 MR. MANGAN: If I could turn to page 14 in the

transcript.

If we could start about halfway down with the sentence, "At least we'll know."

A. "At least we'll know how to initiate a question in the future. Aircraft. If I want to research on something -- you bring me something."

Q. "Another words, you can do this -- the typical collaboration with our guest is -- like this, information aspect of things, they may be -- just -- just to help us --"

A. "Um-hmm."

Q. "-- a help directly -- it's not a very helpful --"

A. "Ah, right."

Q. "We also have a method as well -- just -- just -- we use the project method directly. We -- just -- just do a model or something -- just so to collaboration with them as a course subject."

A. "Right."

Q. "They will do it according to our request -- we can give a more detailed request. And then this -- this is the same as our project with the Aviation Industry Corporation of China."

A. "Hmm."

Q. "It is -- once complete requests -- this goals --"

A. "Um-hmm."

Q. "And details is considered and bring these up, bring these up to for discussion. Just -- just -- you finish the

project, how much time before this -- this -- this submission to us."

A. "Right."

Q. "Even when -- the project, besides submitting the project report to us --"

A. "Um-hmm."

Q. "-- you have to give us -- come over and give a --"

A. "Hmm."

Q. "-- a lecture. Hmm -- another words -- another words --"

A. "Technology exchange."

Q. "-- technology exchange -- another words, your project -- some specific details within your report -- what are they like. You have to give us clear communication."

A. "Thoughts --"

Q. "Right, thoughts need to be communicated. We can all do this."

A. "Didn't he said this earlier, he has done provide systems?"

Q. "Hmm."

A. "I feel like if the institution supports, all can be considered."

"Say -- say -- if the institution supports -- this aspect."

"Just need to mention this to Director Chen."

Q. "No. This thing -- this thing -- what it means to do

10:05:05 this is -- say our department will do it --"

10:05:11 **A.** "Um-hmm."

10:05:12 **Q.** "Just say -- bottom line is -- ours -- questions regarding funding -- we don't need to consider. It means --"

10:05:19 **A.** "Hmm."

10:05:20 **Q.** "Funding -- funding aspect of questions, you don't have to consider. It is something we will discuss with -- with the group. So there is no need for your institute --"

10:05:31 "Just -- no, no -- your institute because currently our service to you have all been complimentary."

10:05:39 "So -- so -- so you don't have to -- don't have to take any consideration on that -- that -- quality price ratio -- consideration on costs -- these are all unnecessary -- we are responsible for everything."

10:05:52 **A.** "Um-hmm, oh."

10:05:55 **Q.** "Er -- you just need to bring up the topic."

10:05:57 **A.** "Right."

10:05:58 **Q.** "We'll conduct discussions, the cost with them."

10:06:00 **A.** "Right."

10:06:01 **Q.** "Hmm. Another words, we'll be bearing these costs."

10:06:05 **A.** "Um-hmm."

10:06:06 **Q.** "You don't have to bear these costs."

10:06:11 **A.** "Actually --"

10:06:13 **Q.** "If you -- because your institution can support funding for the usual -- that -- exchange costs of the type, then --

those are all quite small."

A. "Small amount of money."

Q. "Then this thing provide us, for example -- for example, if the guest comes and gives a lecture, you can pay a little of seminar fee or similar type.

"We bear the larger portion of cost. We'll pay for everything, just like this time. Inclusive of things such as international airfare and such. All these -- all these large-ticket items. We'll bear everything. You don't have to consider these large ticketed items. You only have to consider how to provide you with good services."

A. "Right."

Q. "This visitor, our guest --"

A. "Like what you said. What we're thinking --"

Q. "Take --"

A. "-- whatever questions we have and present the questions --"

Q. "Right."

A. "-- the outward reason of the topic."

Q. "Right."

A. "Right."

Q. "The essential thing is -- because there are a lot of guests like this. Use, there's definitely a use. The key is what method we decide to use for execution, right?"

A. "Right."

10:07:25 **Q.** "Whether it be -- mentioned earlier -- use project type
10:07:32 or you provide me directly with information."
10:07:34 **A.** "Right."
10:07:35 **Q.** "Or et cetera, et cetera, right?" I'm sorry. "Because
10:07:42 sometimes some institutes would just request that I need a
10:07:46 certain document with such and such serial number, they would
10:07:49 gather it --"
10:07:50 **A.** "Um-hmm."
10:07:50 **Q.** "-- just provide me with the documents. I would be
10:07:53 willing to spend the money to buy it."
10:07:55 **A.** "Um-hmm."
10:07:55 **Q.** "But right now it's rather -- to produce something. Then
10:07:59 we -- then we can elect to do it this method."
10:08:02 **A.** "Um-hmm."
10:08:03 **Q.** "Right? Our method can be flexible. Because right now
10:08:07 we -- tell you the truth, we are here to serve you.
10:08:12 "We are a servicing department, right? Talk about the
10:08:15 truth, we -- with that said, we are serving the state."
10:08:19 **A.** "Yes."
10:08:20 **Q.** "Right? We are all serving the state. Everyone -- all
10:08:24 share a same goal."
10:08:25 **A.** "Right, right, right."
10:08:26 **Q.** "So for you -- whatever your consideration -- to utilize
10:08:31 which method to apply these foreign technology, experience
10:08:34 towards our --"

10:08:35 **A.** "Absorbed over."

10:08:37 **Q.** "-- models and projects, right?"

10:08:40 **A.** "Correct."

10:08:41 **Q.** "Our main consideration is this question. Because our previous discussion with Director Yang, we talked about some ambiguous --"

10:08:51 **A.** "Yes."

10:08:52 **Q.** "To discuss and review experts' resume."

10:08:55 **A.** "Right, right."

10:08:56 **Q.** "But this -- after this exchange, we hope a direction -- direction and method -- figured out."

10:09:04 **A.** "Er --"

10:09:07 **Q.** I'd like to stop there and we will fast forward to a different page. I'd like to turn to page 22. And we'll start about halfway down with the line "If you can."

10:09:22 Do you see that, Mr. Wang?

10:09:23 **A.** Yes.

10:09:24 "If you can, try to think from our perspective, help us to collect information in this aspect. Or if you have the expert in the field, we can do advanced communication and draw more detailed requirements -- "

10:09:38 **Q.** "Hmm."

10:09:39 **A.** "This is from my perspective and we can think of this. Also, I'm wondering if you two --"

10:09:45 **Q.** "I got it. I want to ask you for you guys, what type or

what kind of engine are you looking at?"

A. "For the three of us, we are focusing on the helicopter."

Q. "Oh, about turboshaft engine?"

A. "Right. We are all focusing on turboshaft engine."

Q. "Right, basically all about turboshaft engine."

A. "But if you have other stuffs, we have other people to match your source. Because I only represent the profession field I am in --"

"But doesn't have to be specific model."

"-- as long as you can find the information, anything would work."

"Anything would work."

Q. "Anything would work."

A. "If you find turboshaft engine, then we would the team to connect you. But if you find other information, me, or possibly somebody, would connect you.

Q. "Okay, okay. Okay."

A. "That's how this works."

"As for me, in the system field, the topics would be problems from system requirement to index allocation."

Q. "Hmm."

A. "Because just like what we mentioned earlier, allocation of index is an important part of the LRU."

Q. "Hmm."

10:10:55 **A.** "This field -- China -- uh -- countries abroad do not
10:11:00 have this -- this interchangeability concept."
10:11:03 **Q.** "Hmm."
10:11:03 **A.** "So that says, this portion is possibly called index
10:11:08 allocation.
10:11:09 **Q.** "Hmm."
10:11:09 **A.** "We would like to know if there are any index
10:11:13 allocation design products ready."
10:11:15 **Q.** "Hmm."
10:11:17 **A.** "Like how it is originated and what's its basis is.
10:11:30 Uh, one, the basis of the index allocation. Two, the
10:11:33 principle of index allocation, or methods. This is what we
10:11:37 care about. And the second point, they said -- they said
10:11:41 the environment simulation. This -- we need to -- to -- to
10:11:47 look into about the entire environment."
10:11:50 "In terms of direction, it is -- yes, yes, yes."
10:11:55 "Correct, correct."
10:11:56 "It is on the right track, but we need to learn more
10:11:59 about it. More in-depth understanding."
10:12:02 "This point. If we can do it at their standard and
10:12:07 would be best if they can direct us on how to do it."
10:12:10 **Q.** "Hmm."
10:12:10 **A.** "This area -- this area -- the collaboration in this
10:12:13 field wouldn't be easy to do."
10:12:15 "Right on the design."

"Brings it up."

But know -- at least -- at least we will know what items they are bringing to us and we know what it is."

Q. "As for now, the trend of collaboration in our department is we want --"

A. "Um-hmm."

Q. "-- the project -- the bigger, the better."

A. "That's what you hope for?"

Q. "Right. This -- because we only have limited staff, right?"

A. "Hmm."

Q. "If there is one expert coming, it is like -- er -- our department is encouraging this -- this -- since -- if you are spending the same amount of time, I need to make --"

A. "Um-hmm."

Q. "-- this project -- the bigger, the better."

A. "Um-hmm."

Q. "Because what you'll actually bring up -- I think this -- of course, you hope to solve specific current obstacles you are facing, right?"

A. "Correct."

Q. "Because what we hope is if we can package these things."

A. "Um-hmm."

Q. "And the method is to operate it as a project?"

A. "This type of method."

10:13:16 **Q.** "This type of method, that means for me, first I'll apply
10:13:19 for funding --"
10:13:20 **A.** "Um-hmm."
10:13:20 **Q.** "-- including this -- apply for project -- apply for
10:13:24 funding, it would be easier, right? I can say this is for the
10:13:27 institute for certain model and how we will solve the
10:13:30 obstacles --"
10:13:31 **A.** "Correct."
10:13:31 **Q.** "-- solving on different aspects, right?"
10:13:33 **A.** "Um-hmm."
10:13:34 **Q.** "For instance, how much time the guest will take --"
10:13:38 **A.** "Correct."
10:13:38 **Q.** "-- and what kind -- how much of compensation, right?"
10:13:41 **A.** "Um-hmm."
10:13:42 **Q.** "This -- this -- if you only request one document, this
10:13:46 is going to be a small matter."
10:13:49 "Small matter, right?"
10:13:52 **A.** "Small matter, yes, yes."
10:13:55 **Q.** "But if you say -- mentioned earlier, we're here to
10:13:59 resolve a system issue --"
10:14:00 **A.** "Correct."
10:14:00 **Q.** "-- can -- can -- can you improve our method of
10:14:04 practice --"
10:14:06 **A.** "Right."
10:14:06 **Q.** "-- then we can enlarge this project?"

10:14:07 **A.** "Right."

10:14:07 **Q.** "-- make it big -- packaging it and resolving issues on many aspects, right? And then "T" -- this can be, this can really serve the technology aspect for the state. As for money for our state, the funding for the aviation field is not a problem, right? That says, some -- some specific requirements brought up here I can talk about it back to the department."

10:14:29 **A.** "Right."

10:14:34 **Q.** "I -- I suggest that if we focus on him, maybe we can establish a project."

10:14:39 **A.** "Package a project."

10:14:40 **Q.** "-- a project specifically for him. For example, like what we said.

"Can we use the method of a course --"

10:14:46 **A.** "Um-hmm."

10:14:49 **Q.** "-- or project. I'll bring it up to him directly. You bring your request, I can tell him we will need half in a year --"

10:14:49 **A.** "Um-hmm."

10:14:57 **Q.** "-- or a year's time to finish this project. Actually, people who are like -- like -- like -- like him, a foreign -- pure, pure technical expert --"

10:14:58 **A.** "Um-hmm."

10:15:01 **Q.** "-- he doesn't have too much to do --"

10:15:06

10:15:09

10:15:10

10:15:12 **A.** "Um-hmm."

10:15:12 **Q.** "-- or hobby --"

10:15:13 **A.** "Um-hmm."

10:15:13 **Q.** "-- he has energy and he has time, and because he is still in good health condition, right? He can -- and he said he will retire in two years and whatnot. He wants to, right? He has this ability. He is competent. And he is willing to -- to do something. We can design something for him.

10:15:33 **A.** "As the project progresses, what's his requirement? Like he said earlier, should we focus on certain aspect?"

10:15:41 **Q.** "Hmm."

10:15:43 **A.** "Why, and why he is doing this. It's going to be difficult for us to control that part."

10:15:48 **Q.** "What if, uh, currently we are -- this is the initial stage, to focus on him personally --"

10:15:55 **A.** "Um-hmm."

10:15:56 **Q.** "-- how much can he do and how far can he reach, currently."

10:16:00 **A.** "Just like what we talked about."

10:16:03 "Personal -- personal."

10:16:04 **Q.** "Say, how much time will it take?"

10:16:07 **A.** "We need to prepare first, right?"

10:16:09 "To bring up the question.

10:16:11 "The questions need to be prepared beforehand."

10:16:15 **Q.** "Hmm. For example, it's like what questions are -- eh --

addressed and how many days will the course take, right?"

A. "Right."

Q. "You -- I know that you don't just come here to give lecture for a day or so."

A. "Yeah, you need to focus on the questions --"

Q. "Hmm."

A. "-- focus on the questions."

Q. "The lecture will focus on the questions, right?"

A. "That's right. We are doing the same thing. Bring up the questions."

Q. "Ah, right."

A. "Bring up questions and answer on those questions. From what's understood today, sometimes we don't know. Originally we don't know what questions to ask, right?"

Q. "Um-hmm."

A. "Bring up the questions -- right now he has prepared so much, but we don't know what to ask him."

Q. "Hmm."

A. "Now we know and we can now prepare those focused questions, and those may be answered, right?"

Q. "Hmm."

A. "Lecture-wise, it won't take too much time."

Q. "Not too much time? Then we can do it. He will need to prepare once he goes back, like what kind of materials and what kind of parameters, right? It's like what you said, is

10:17:24 there particular parameters or particular --"
10:17:28 **A.** "Parameters."
10:17:29 **Q.** "-- or a model, a -- do you need him to create a
10:17:33 package?"
10:17:34 **A.** "-- need to go back to discuss. For this particular
10:17:37 field --"
10:17:39 **Q.** "This is for example. Is this a feasible method?
10:17:44 Since -- since I am not an expert in the technical field --
10:17:47 for example, right now, for example, if we are making this
10:17:51 mug, right? Is it possible that I ask you to make a bottle
10:17:54 like this, it might not be identical, but just a concept.
10:17:58 After I read your report, then I would ask why you say that
10:18:02 and think this way -- would this method work?"
10:18:06 **A.** "Same difference, same difference."
10:18:08 **Q.** "Um-hmm, um-hmm. This -- you can have him to create
10:18:13 something and afterwards we review the report. We can then
10:18:16 ask him what to talk about."
10:18:18 **A.** "Oh, oh, I understand what you mean. I understand."
10:18:20 **Q.** "Hmm."
10:18:20 **A.** "This is like opening a specific technology project."
10:18:24 "Right, right."
10:18:25 **Q.** "Um-hmm."
10:18:26 **A.** "He will do a small portion of this project --"
10:18:29 **Q.** "Right."
10:18:30 **A.** "-- and then he can analyze and add something more --"

10:18:35 **Q.** "Right, right, right."

10:18:36 **A.** "-- to produce a -- a report, and we can digest this topic.

10:18:40 "Ah, right, right."

10:18:42 **Q.** "Right, right, right."

10:18:44 **A.** "Then he can come and do a lecture."

10:18:45 **Q.** "Right, right, right."

10:18:48 **A.** "Establish a question and produce a report on this virtual project."

10:18:50 "Right, right. Virtual project. It is called virtual project."

10:18:53 **Q.** "Right, right.

10:18:55 "This way -- he probably is -- if I do this, I will have a direction."

10:19:00 **A.** "There are -- there are still many things we want to figure out. This is for sure."

10:19:01 "If it is going to be a virtual project, it needs to be packaged into a project."

10:19:07 "Virtual project, right, right."

10:19:11 **Q.** "Right, right, packaging, right."

10:19:13 **A.** "First step, so according to what you meant is the first step can be giving a lecture and everyone can know everyone better."

10:19:17 **Q.** "Um-hmm."

10:19:20 **A.** "That's what it means. Then you can progress to

10:19:22

10:19:25

10:19:29

10:19:32

10:19:33

10:19:34

10:19:37 package the project phase."

10:19:39 "Is the easiest."

10:19:41 **Q.** "Because -- and also the project we are doing, it's not like we can make it to a large course at the institution to have every technician come and listen to the course, right? For instance, for your discipline, for sure, we only have a few experts coming in to serve the need."

10:19:59 **A.** "Right, right. Not -- not a big class."

10:20:02 "Institute."

10:20:04 **Q.** "No -- this -- this -- this -- we can also do this at Wuxi or Nanjing. For example, depends on how many people. For example, if this will take a long time, we can do this at Wuxi. We can rent place, like rent a hotel for several days for the lecture. We'll come and lecture for a few days. That's another way, right?"

10:20:26 **A.** "Overall, if this is the virtual project --"

10:20:29 "-- it's possibly to package other professions."

10:20:32 "Right, right. Such as the system."

10:20:36 "Many of the HMU norms he said were done by other divisions. Not all by himself. Many works were categorized and others would do other portions."

10:20:47 **Q.** All right. Why don't we stop there for a moment.

10:20:49 **A.** Okay.

10:20:50 MR. MANGAN: And we'd like to fast forward to page 34. And we'll continue from there.

10:20:53

10:20:58 THE COURT: How are the interpreters doing? Need a break?

10:21:01 THE INTERPRETER: We are fine.

10:21:04 THE INTERPRETER: Fine.

10:21:05 THE COURT: Very well. You may proceed, Mr. Mangan.

10:21:11 BY MR. MANGAN:

10:21:12 **Q.** We have one last section to go through, Mr. Wang. We'll start on page 34, about halfway down.

10:21:15 **A.** Okay.

10:21:18 **Q.** Do you need a glass of water or are you okay?

10:21:33 **A.** Okay.

10:21:33 "He seems like he is taking easy. China still has a gap comparing to them. This is something we really want to acquire. After the communication with him --"

10:21:42 **Q.** "Hmm."

10:21:42 **A.** "-- I want to find out if he has any other ways to this field. We still have some questions. The industry level in China is as it is --"

10:21:51 **Q.** "Hmm."

10:21:52 **A.** "-- we can only extend the life span, and including the design basis --"

10:21:57 **Q.** "Hmm."

10:21:57 **A.** "In it we haven't touched base on."

10:22:00 **Q.** "Hmm."

10:22:00 **A.** "For this field, the China -- foreigners working in

10:22:04 this field have overall higher technical standards.

10:22:13 "I would prefer more if this portion can be connected.

10:22:16 But there is another thing I want to talk about --"

10:22:19 **Q.** "Hmm."

10:22:20 **A.** "-- regarding that -- some -- some foreign-made parts."

10:22:24 **Q.** "Hmm."

10:22:24 **A.** "Is there ways to get those information?"

10:22:28 **Q.** "Are you talking about getting information or the actual

10:22:30 item?"

10:22:31 **A.** "Actual items, has to be."

10:22:33 **Q.** "Ah actual item. Like what? Component information?"

10:22:38 **A.** "Like LRU, like some pumps."

10:22:41 **Q.** "Oh, some pumps?"

10:22:42 **A.** "Right, pumps and some other stuff because China hasn't

10:22:46 reached that level yet, and that's what we want to acquire."

10:22:49 **Q.** "This should be related to your mechanical processing

10:22:52 types of things, right?"

10:22:53 **A.** "Right, mechanical. Not --"

10:22:55 **Q.** "I know. I know."

10:22:58 **A.** "We used to find other routes, but it's very hard --

10:23:01 very hard to acquire."

10:23:03 "Do you know which company makes them?"

10:23:06 "Yes, we know all of them."

10:23:09 "You all know."

10:23:11 **Q.** "You should, because including what you told -- said

10:23:15 earlier, because when we -- because when we are out there to
10:23:19 look for a target --"
10:23:21 **A.** "It would be best if you have a clear target. It would
10:23:25 be best if you know which makes which component."
10:23:28 **Q.** "Right. It would be best if you know specific company.
10:23:31 Because our work focus is different from yours. You are
10:23:35 technical people, and you can focus on specific technology.
10:23:38 But we are different."
10:23:41 **A.** "Institution."
10:23:42 **Q.** "We look -- we look which company you belong to, and we
10:23:45 look for the people within that company. You know what I
10:23:48 mean?"
10:23:48 **A.** "Right, right."
10:23:49 "Right, right."
10:23:50 **Q.** "For example, if I'm an aircraft person, then I would
10:23:53 search into -- into Boeing or Lockheed, right? Find it at
10:23:58 Lockheed Martin."
10:24:00 **A.** "Um-hmm."
10:24:00 **Q.** "After I found the person, I would find out if this
10:24:03 person is doing something -- something right. Like in charge
10:24:07 of overall design or avionics."
10:24:09 **A.** "Right."
10:24:10 **Q.** "That says if you -- you have this specific request --"
10:24:14 **A.** "Um-hmm."
10:24:15 **Q.** "I probably cannot find what you need, right?"

10:24:18 **A.** "Right."

10:24:20 "Hmm."

10:24:21 **Q.** "You mentioned you wanted a pump. Where am I going to find a pump, right?

10:24:25 "That says, you need to tell me --"

10:24:28 **A.** "This field, we were working on this too."

10:24:32 **Q.** "Hmm."

10:24:32 **A.** "We have tried many routes."

10:24:35 **Q.** "Hmm."

10:24:36 **A.** "But it's difficult because at that time it was the state which gave us money for us to find."

10:24:41 **Q.** "Oh."

10:24:42 **A.** "But can't find anything."

10:24:44 **Q.** "Yes."

10:24:44 **A.** "Just can't find it. No way to find it."

10:24:48 **Q.** "Sometime, for example, if I obtained some -- from a company -- originally I was looking for a fan blade, but after I saw the pump and figured I have no use for it, I would discard the information, you know?"

10:25:03 **A.** "Right, right."

10:25:04 **Q.** "I don't know where the pump will be used for."

10:25:07 **A.** "Right, right."

10:25:08 "Right."

10:25:10 "This part, after we return, we will sort it out. This part -- the U.S. is somewhat strictly securing it."

10:25:18 **Q.** "Because -- because you sometimes -- there are many
10:25:22 institutions under AVIC."
10:25:24 **A.** "Um-hmm."
10:25:26 **Q.** "Every institution brought up many inquiries, right?"
10:25:29 **A.** "Right."
10:25:29 **Q.** "All these inquiries came to our ministry, but our
10:25:33 priority is -- I think is to serve things at systematic
10:25:36 level."
10:25:37 **A.** "Um-hmm."
10:25:38 **Q.** "For now, we would prioritize Yuan Hong or Two Engines
10:25:43 special project, right?"
10:25:44 **A.** "Right."
10:25:46 **Q.** "Serving the big projects first. Things like pumps and
10:25:49 such which are relatively smaller --"
10:25:51 **A.** "Um-hmm."
10:25:52 **Q.** "-- they might receive the inquiries but not passing down
10:25:56 the inquiries. That means we don't know about these things."
10:26:01 **A.** "Right, right."
10:26:03 **Q.** "That says, for use, since your institution is also in
10:26:07 Wuxi and is close to where we are, we can have direct --
10:26:13 direction communication."
10:26:13 **A.** "If you have the information, we can match on."
10:26:16 **Q.** "Right. It's possible. We used to have --"
10:26:20 **A.** "This is an opportunity. We were unable to connect to
10:26:24 each other in the past."

10:26:25 **Q.** "Right, right. And to be honest, we have worked for many
10:26:29 years and we have a lot of information, but sometimes I think
10:26:32 those are not fully utilized. Plus, I don't know -- I don't
10:26:36 know these information are for sure handy, but we don't know
10:26:38 where to use them."
10:26:40 Right? I don't know where to use them, but -- but I know
10:26:44 they are beneficial. But I also don't have time to find who
10:26:47 needs them."
10:26:48 **A.** "Right, right, right. Okay."
10:26:50 "Okay. This is like a -- like an opportunity."
10:26:54 "Right, right."
10:26:55 "After we return -- our institution has several demands
10:26:58 that we are eager to know. But we can't find source to meet
10:27:02 the demand. Foreign countries have already done so much
10:27:06 research."
10:27:07 "Maybe it's possible to get some paper documents, and
10:27:11 Director Yang has the classified recording which we can --"
10:27:14 "Right, right. Okay, okay."
10:27:19 **Q.** "Sure, sure. Then that's it. For tonight, I will
10:27:22 accompany the guest --"
10:27:24 **A.** "You do what you need to do."
10:27:26 "You do what you need to do."
10:27:28 **Q.** "Let's ask Department Head Chai to treat you guys for a
10:27:32 meal."
10:27:32 **A.** "No, no."

10:27:33 **Q.** "Meal is a must."

10:27:34 **A.** "No, no."

10:27:35 **Q.** "No, no. Since you are here and it's about time to eat, let's eat. You are here, and we need to be a good host."

10:27:43 And we'll stop there.

10:27:54 MR. MANGAN: Your Honor, I have no further questions for this witness.

10:27:57 THE COURT: Very well. This is probably a good moment to take our midmorning break. It's 10:30. We'll break for 20 minutes. I will ask you to come down. During the break, enjoy the break, take the break. Don't discuss the case among yourselves or with anyone else. No independent research. Continue to keep an open mind.

10:28:16 Out of respect for you, we will rise as you leave.

10:28:20 THE COURTROOM DEPUTY: All rise for the jury.

10:28:24 (Jury out at 10:28 p.m.)

10:28:55 THE COURT: The jury's left the room. The door is closing.

10:29:00 Can we break for 20 minutes or are you going to need my attention outside the presence of the jury? From the government?

10:29:07 MR. MANGAN: No, Your Honor.

10:29:08 THE COURT: The defense?

10:29:09 MR. MIEDEL: No, Your Honor.

10:29:10 THE COURT: 20-minute break.

10:29:17 THE COURTROOM DEPUTY: The court is now in recess.

10:29:19 (Recess from 10:29 a.m. until 10:50 a.m.)

10:50:51 THE COURT: Are we ready for the jury from the government's perspective?

10:50:55 MR. MANGAN: Yes, Your Honor.

10:50:56 THE COURT: From the defense?

10:50:58 MR. MIEDEL: Yes.

10:50:58 THE COURT: Very well. Let's call for the jury, please.

10:51:00

10:52:23 THE COURTROOM DEPUTY: All rise for the jury.

10:52:25 (Jury in at 10:52 a.m.)

10:52:59 THE COURT: You may all be seated.

10:53:01 The jurors, 15 of them, have returned from break. Thank you for your continuing work.

10:53:05

10:53:09 The defense now has a chance to ask questions of this witness.

10:53:12

10:53:14 MR. MIEDEL: Thank you, Your Honor.

10:53:15 THE COURT: Yes.

10:53:17 **CROSS-EXAMINATION**

10:53:18 BY MR. MIEDEL:

10:53:19 **Q.** Good morning, Mr. Wang.

10:53:22 **A.** Good morning.

10:53:22 **Q.** My name is Florian Miedel. I am an attorney for Mr. Xu.

10:53:29 Mr. Wang, would it be fair to say that you were the primary language specialist assigned to this case?

10:53:32

10:53:35 **A.** Yes.

10:53:35 **Q.** And it's also fair that there was a tremendous amount of material in this case that was in Chinese, correct?

10:53:41 **A.** Yes.

10:53:42 **Q.** There were lots of documents and emails and chats and other documents all in Chinese that had to be translated, correct?

10:53:52 **A.** Yes.

10:53:52 **Q.** And you were -- when did you first become involved in this case?

10:53:59 **A.** In 2017.

10:54:00 **Q.** Okay. So that would be a year before Mr. Xu was arrested?

10:54:04 **A.** Yes.

10:54:11 **Q.** And so you are well aware of the various evidence that exists in this case, correct?

10:54:13 **A.** Yes.

10:54:20 **Q.** And you, in fact, testified I think that you traveled to Belgium twice, correct?

10:54:24 **A.** Three times.

10:54:28 **Q.** Three times, okay.

10:54:33 So you were working very closely with the case agent in this case, Agent Hull, right?

10:54:36 **A.** Yes.

10:54:39 **Q.** Now, on direct you testified about a couple of phone

10:54:41

10:54:46 conversations that took place in March of 2018 between the
10:54:55 General Electric employee and Mr. Qu, correct?
10:55:02 **A.** Yes.
10:55:02 **Q.** And those conversations took place three and a half years
10:55:05 ago, right?
10:55:05 **A.** Yes.
10:55:06 **Q.** In preparation for your testimony today, did you review
10:55:10 any notes or memos about those conversations?
10:55:15 **A.** Yes.
10:55:16 **Q.** What are those?
10:55:17 **A.** The summaries I wrote and the -- and the -- what's that
10:55:33 called -- the documents the agents produced.
10:55:39 **Q.** About those specific calls?
10:55:41 **A.** Yes.
10:55:42 **Q.** And you personally took notes on those calls?
10:55:44 **A.** I did.
10:55:45 **Q.** Okay. And in order to refresh your recollection or your
10:55:48 memory, you reviewed those notes before you testified today,
10:55:51 correct?
10:55:52 **A.** I reviewed the documents the agent produced.
10:55:57 **Q.** Okay. Now, one of the pieces of evidence that you
10:56:08 listened to in this case was a tape recording that was made
10:56:14 between an individual named Zhang and Mr. Xu. Do you remember
10:56:24 that?
10:56:24 **A.** How do you spelled that?

10:56:26 **Q.** Z-H-A-N-G. He was a professor at NUAA who was tutoring
10:56:32 Mr. Xu on an entrance exam. Do you remember that?
10:56:35 **A.** Yes.
10:56:35 **Q.** And you listened to that recording, correct?
10:56:41 **A.** Right.
10:56:41 **Q.** And you offered your opinions about what that recording
10:56:44 was about to Agent Hull, among others at the FBI, correct?
10:56:48 **A.** I didn't offer my opinion. I offer my translation.
10:56:53 **Q.** Well, okay. You were not the primary translator of that
10:56:59 particular recording, though, were you?
10:57:00 **A.** No.
10:57:00 **Q.** But you reviewed the recording, right?
10:57:03 **A.** Yes.
10:57:03 **Q.** And you reviewed the translations, right?
10:57:06 **A.** I look at it, yes.
10:57:08 **Q.** Okay. So you are aware that that particular recording
10:57:22 was a conversation between Professor Zhang -- I don't know if
10:57:28 I am pronouncing that correctly -- and Mr. Xu, right?
10:57:32 **A.** Right.
10:57:32 **Q.** And that conversation, it appears to be that Mr. Xu was
10:57:37 taking the entrance exam to attend NUAA in Nanjing, correct?
10:57:46 MR. MANGAN: Your Honor, objection as to scope. I
10:57:48 did not inquire about this particular recording.
10:57:55 MR. MIEDEL: Your Honor, Mr. Wang testified about
10:57:57 various translations and evidence that he translated in this

10:58:00 case. It's certainly relevant.

10:58:03 THE COURT: But he didn't testify about this. It's

10:58:05 beyond the scope. Objection's sustained.

10:58:28 MR. MIEDEL: Give me one moment, Your Honor?

10:58:36 THE COURT: Yes.

10:59:07 (Pause.)

10:59:07 MR. MIEDEL: Your Honor, could we just have a brief

10:59:09 sidebar?

10:59:10 THE COURT: Yes. I will see the lawyers at sidebar.

11:02:01 (At sidebar.)

11:02:01 MR. MIEDEL: Your Honor, I was going to ask this

11:02:01 witness about a conversation that's already in evidence, and

11:02:01 he's the one who offered opinions about that particular

11:02:01 conversation. I understand that Mr. Mangan didn't ask about

11:02:01 it on direct. In that case, we would want to call Mr. Wang on

11:02:02 our direct case simply for that conversation. It seems to be

11:02:02 sort of unnecessary to go through that exercise, but if we

11:02:02 need to, we will, in which case we would ask the government to

11:02:02 waive its 103 obligations.

11:02:02 THE COURT: You would ask the government what?

11:02:02 MR. MIEDEL: To waive the obligations we have to

11:02:02 call a federal agent as a witness.

11:02:02 MR. MANGAN: Your Honor, we'd be fine proceeding

11:02:02 that way.

11:02:02 I would just want to note that he is the linguist, and we

11:02:02 may object to getting too far into asking him to testify like
11:02:02 an agent when he is just a linguist, but I am okay with what
11:02:02 he is requesting.
11:02:03 THE COURT: Why mess with that process if it's
11:02:03 coming in anyway?
11:02:03 MR. MANGAN: Hmm?
11:02:03 THE COURT: Why make them do that when it's coming
11:02:03 in anyway? Can't we just get this guy on and off?
11:02:03 MR. MANGAN: No, I was saying I agree with that,
11:02:03 yes.
11:02:03 THE COURT: So he can proceed with questioning at
11:02:03 this point?
11:02:03 MR. MANGAN: Yes. If they were going to recall him,
11:02:03 that's fine. We can just do it here.
11:02:03 THE CLERK: May I ask a question?
11:02:03 THE COURT: Please.
11:02:03 MS. FRANKIAN: Should we instruct the jury that the
11:02:03 defense is going to call this witness. Rather than having him
11:02:03 come back, we are going to allow you to conduct the direct
11:02:04 examination now, essentially?
11:02:04 MR. MIEDEL: I mean, I don't know why that's
11:02:04 necessary, but I don't know.
11:02:04 MS. FRANKIAN: We often do. That's why I was
11:02:04 asking.
11:02:04 THE COURT: Fair enough.

MR. MIEDEL: It's a pretty limited area. I am not going to take long. It's important, so we would recall him if necessary.

THE COURT: Do you promise?

MR. MIEDEL: Yes.

THE COURT: Very well.

(In open court.)

THE COURT: Thank you for your patience, members of the jury.

MR. MIEDEL: May I proceed, Your Honor?

THE COURT: Yes, on direct when we get to what we talked about.

MR. MIEDEL: On cross.

THE COURT: No leading questions in that phase.

MR. MIEDEL: Yes, Your Honor.

BY MR. MIEDEL:

Q. Mr. Wang, I was just asking you about the conversation that you listened to between a professor at NUAA named Zhang, Z-H-A-N-G, and Mr. Xu. Do you recall that?

A. Yes.

Q. Okay. What was the -- what was the general gist of that conversation; do you remember?

A. Yes.

Q. What was it about?

A. It was about Professor Zhang was tutoring Xu, and they

were dining, and then she was telling Professor Zhang about his job, his employment, and what he does.

MR. MIEDEL: I am going to ask to publish or put on the screen, since it's already in evidence, Exhibit 31b.

THE COURT: 31b we will publish. Is it on the screen? It's coming, 31b?

BY MR. MIEDEL:

Q. There we go.

Mr. Wang, this is the transcript of that conversation; is that right?

A. Yes.

Q. Okay. Can we go to page 4?

Okay. I'm going to do something similar that Mr. Mangan did. I am going to ask you to read from this transcript, okay. If it's okay with you, you can be Professor Zhang and I'll be Mr. Xu, okay?

A. Okay.

Q. Could you start with where it says, "Otherwise, the three of us"?

A. "Otherwise, the three of us will all -- honestly --"

Q. "Right, right."

A. "-- lose our jobs. Even if you fail the exam, you still safely keep your job."

Q. "Still have to do the job."

A. "It's not a must do. It's just icing on the cake."

11:05:35 **Q.** "Right, right."

11:05:35 **A.** "But if you do this then -- right?"

11:05:38 **Q.** "Right, right. I understand. That's why my travel. So --"

11:05:42 **A.** "Then it will do all three of us in. To be honest in private, this is simply copyright violation, right?"

11:05:50 **Q.** "Right, of course. I understand. That's why --"

11:05:52 **A.** "Because this is trying to steal others' secrets, oh?"

11:05:56 **Q.** "I understand."

11:05:57 You can stop there.

11:06:02 This conversation about stealing secrets, is it fair to say that that had to do with the entrance exam questions to the exam that Mr. Xu was taking?

11:06:13 **A.** No.

11:06:19 **Q.** Well, you sent -- do you recall sending an email to Agent Hull in August of 2019 about this particular recording?

11:06:37 **A.** Maybe.

11:06:39 **Q.** Okay. I'm happy to show you a copy of it. It's marked for identification exhibit -- I'm sorry -- government production 10968.

11:06:59 MR. MIEDEL: May I approach, Your Honor?

11:07:01 THE COURT: Is this for the purpose of refreshing his recollection?

11:07:04 MR. MIEDEL: For purposes of refreshing his recollection.

11:07:07 THE COURT: You may approach.

11:07:20 THE WITNESS: Yes.

11:07:24 BY MR. MIEDEL:

11:07:24 **Q.** Have you taken a look at that email?

11:07:26 **A.** I remember this email.

11:07:27 **Q.** Okay, great. I'll take it back then.

11:07:31 MR. MIEDEL: May I approach?

11:07:35 THE COURT: You can ask if it refreshed his recollection.

11:07:40 MR. MIEDEL: He said he remembered the email.

11:07:50 BY MR. MIEDEL:

11:07:51 **Q.** And, Mr. Wang, isn't it true that it is your belief based on your review of this document, of this recording that Mr. Xu was preparing for the entrance exam of the master's program and that they were not likely going over stolen materials. Do you remember that?

11:08:14 **A.** I remember that.

11:08:18 **Q.** And you listened to the entire clip, right? And so you are aware that the professor was giving Mr. Xu the questions to the exam, right?

11:08:28 **A.** Yes.

11:08:32 **Q.** And he was worried about getting in trouble about that, right?

11:08:36 **A.** He was worried about not passing exam.

11:08:39 **Q.** Sorry?

11:08:40 **A.** He was worried -- can you rephrase your question?
11:08:44 **Q.** The professor was worried about getting in trouble about
11:08:50 that, right?
11:08:51 **A.** Yes.
11:08:51 **Q.** And it was -- is it fair to say that it was your opinion
11:09:19 that this conversation had nothing to do with stolen secrets?
11:09:26 Or stolen materials?
11:09:29 **A.** I wrote that they didn't go over any stolen secrets but
11:09:34 they talk about stealing secrets.
11:09:45 MR. MIEDEL: Can we go to page 12 of this document?
11:10:03 One moment.
11:10:15 Let's go down to the bottom.
11:10:15 BY MR. MIEDEL:
11:10:23 **Q.** Do you recall a part of this conversation being about
11:10:27 secret leak incidents, or leaks?
11:10:33 **A.** Yes.
11:10:34 **Q.** Okay. And is it fair to say that they were talking about
11:10:39 security leaks among professors at NUAA? Do you remember
11:10:47 that?
11:10:47 MR. MANGAN: Object. Calls for speculation.
11:10:56 BY MR. MIEDEL:
11:10:56 **Q.** If you recall.
11:10:59 THE COURT: The objection's overruled. The question
11:11:04 is okay.
11:11:08 MR. MIEDEL: Actually, scroll to the next page if

you can.

BY MR. MIEDEL:

Q. You can take -- you can read that first part at the top to yourself if that refreshes your recollection about that.

So, Mr. Wang, is it fair to say that they are talking about the monitoring of individuals in China?

A. Yes.

Q. Okay. And about Mr. Xu and his colleagues monitoring people in China, right? Chinese citizens; is that right?

MR. MANGAN: I'll object, Your Honor. He is asking him to interpret as opposed to just reading what was said.

THE COURT: Why don't we have him read whatever the defense wants in evidence.

BY MR. MIEDEL:

Q. Okay. So why don't we just read that top part here. I will read Mr. Xu.

"Nowadays, on the Internet, for example, they are in need of faculty member. Some Nan Hang (NUAA) faculty member posts something like picture after work, we basically can see it."

Can you read Mr. Zhang?

A. "You can see all that?"

Q. "Mm. There are indeed too many leaks."

A. "Mm. Look, some faculty members at home, their contact with the U.S. or UK, send email, you can see that too?"

Q. "Yes."

A. "You can see. The specific content?"

Q. "Can see all that."

We'll stop there.

There, in your -- in your review of this tape, they were talking about internal security measures in China, right?

A. I think so.

Q. Thank you.

MR. MIEDEL: I don't have anything further.

THE COURT: Very well.

Redirect, if any?

MR. MANGAN: Yes, Your Honor. If we could use the overhead, please.

THE COURT: Yes.

MR. MANGAN: And this is from Exhibit 31b, the same transcript we were just discussing.

THE COURT: Very well.

MR. MANGAN: Page 15.

THE COURT: This should be on the screens, right?

REDIRECT EXAMINATION

BY MR. MANGAN:

Q. Do you see that on your screen, Mr. Wang?

A. Yes.

THE COURT: The jury sees it as well?

(Jurors nodding heads.)

THE COURT: All right.

BY MR. MANGAN:

Q. Mr. Wang can you read the first statement at the top by the defendant, Mr. Xu?

A. "We are under great pressure, because the job of ours is not like you can do it by sitting at home. The leadership asks you to get the materials of the U.S., the U.S. F-22 fighter aircraft. You can't get it by sitting at home."

Q. And then does the professor respond, "Hmm. You also have to flip someone, travel outside China, and take the risk"?

A. That's correct.

MR. MANGAN: Nothing further, Your Honor.

THE COURT: Very well. What exhibit was that? I'm sorry?

MR. MANGAN: Exhibit 31b. We were reading from page 15.

THE COURT: Very well. Recross, if any.

MR. MIEDEL: No, Your Honor.

THE COURT: Very well. Sir, your testimony's complete. You may step down and leave the room. Thank you.

THE WITNESS: Thank you.

THE COURT: Is the government prepared to call its next witness?

MS. GLATFELTER: Yes, Your Honor. The government calls Eric Ridder.

THE COURT: Someone has gone to get him, no doubt?

MS. GLATFELTER: Yes, Your Honor.

THE COURT: Very well.

The gentleman would approach to the witness stand over here. Walk around the Plexiglas, and if you'd be willing to pause where you are and take the oath to tell the truth.

If you'd raise your right hand. Do you solemnly swear or affirm the testimony you are going to give today is the truth, subject to the penalty of perjury?

THE WITNESS: I do.

ERIC RIDDER, PLAINTIFF WITNESS, SWORN

THE COURT: Very well. Get seated, take a moment. The seat tips back on occasion, just for full disclosure. I need you close to the mic.

THE WITNESS: Yep.

THE COURT: And the attorney for the government will begin with some questions of you.

Ms. Glatfelter.

MS. GLATFELTER: Thank you.

DIRECT EXAMINATION

BY MS. GLATFELTER:

Q. Sir, will you state your name and spell it for the record.

A. Yes, my name is Eric Ridder, E-R-I-C R-I-D-D-E-R.

Q. Thank you. And, Mr. Ridder, are you employed?

11:17:46 **A.** I am.

11:17:46 **Q.** Can you tell the ladies and gentlemen of the jury where you are employed?

11:17:48 **A.** GE Aviation.

11:17:49 **Q.** And what's your current job title there?

11:17:50 **A.** I am VP Cyber Security.

11:17:53 **Q.** How long have you had that title?

11:17:55 **A.** For approximately four and a half years.

11:17:57 **Q.** Now, when you say "cyber security," what do you mean that you are the vice president of cyber security?

11:18:00 **A.** Yes. So there is a few kind of key areas of responsibility that I have: threat management, which is really external cyber threats. If you think about cyber actors that are trying to interrupt GE's operations.

11:18:06 I also have responsibility for data protection, our data loss prevention programs, and our insider threat program at a high level.

11:18:12 **Q.** And you said you have been doing this work for about four and a half years?

11:18:16 **A.** Under the capacity of VP, but approximately eight years with the majority of that scope I mentioned.

11:18:21 **Q.** Okay. And so you've had previous positions at GE?

11:18:30 **A.** That's correct.

11:18:32 **Q.** How long have you been there total?

11:18:33 **A.** For approximately 16 years.

11:18:48 **Q.** Can you tell the ladies and gentlemen of the jury some of
11:18:51 the other positions that you've had there?
11:18:53 **A.** Yes. So I started out as an intern, and then I went
11:18:57 through their digital technology or IT leadership program.
11:19:01 But after that rotational program, I worked in the IT
11:19:05 department that helps to develop the tools used by our
11:19:09 engineering division. I was specifically focused for around
11:19:13 five years on --
11:19:14 THE COURT: Excuse me, sir. You are doing great.
11:19:19 THE WITNESS: Sure.
11:19:20 THE COURT: But we're translating it.
11:19:23 THE WITNESS: Sorry, yes.
11:19:24 THE COURT: Slow down.
11:19:26 THE WITNESS: I'll slow down just a bit. My
11:19:26 apologies.
11:19:27 So with that capacity, I was responsible for helping to
11:19:29 build and develop the tools that are used, some of the tools
11:19:32 used by our engineers in the design engineering processes.
11:19:38 And then after that is when I moved to the IT security
11:19:42 space, cyber security, and originally started with a focus on
11:19:46 data loss prevention.
11:19:50 THE COURT: Even slower.
11:19:51 THE WITNESS: Sure.
11:19:54 BY MS. GLATFELTER:
11:19:54 **Q.** Do you supervise anyone in your current role?

11:19:57 **A.** Yes, I do.

11:19:58 **Q.** Who do you supervise?

11:20:00 **A.** I supervise a team of professionals focused on cyber security operations, so that would be team members focused on things like cyber intelligence, our detection and incident response capabilities, and again the data loss prevention insider threat data governance areas as well.

11:20:24 **Q.** And how many people are on the team that you supervise?

11:20:30 **A.** On my --

11:20:31 **Q.** Just an estimate.

11:20:32 **A.** Sure. On my specific team, there's 55.

11:20:39 **Q.** And who do you report to at the company?

11:20:40 **A.** I report to the chief information security officer.

11:20:44 **Q.** Okay. And where is the chief information security officer in the structure at GE Aviation.

11:20:49 **A.** He reports to our chief information officer, who reports directly to the CEO.

11:20:55 **Q.** Now, sir, what type of training have you had that's qualified you for your current position?

11:21:01 **A.** Sure. So I received an associate's and a bachelor's from the University of Cincinnati in IT. I also have a MBA from Xavier University. I've received training internally at GE for my job scope, and I've also participated in additional trainings externally with other members of the cyber security profession. And then obviously the on-the-

job experience.

Q. Okay. And I might have missed it in there. Did you say that you had a background, like a bachelor's degree or a master's degree relevant to this experience?

A. Yes, so my bachelor's degree is within information technology. I had a focus on networking and experiences in database technologies, web technologies, and cyber security as well, too. And all of those are a basis or foundation for the cyber security field, understanding how computers and networks work.

Q. Okay. And where did you receive your bachelor's from?

A. From the University of Cincinnati.

Q. Okay. And did you -- have you obtained a master's degree?

A. I have. I have an MBA, master's in business, from Xavier University here locally.

Q. Now, you said you work for GE Aviation. Where's GE Aviation headquartered?

A. In Evendale, Ohio, just north of Cincinnati, Ohio.

Q. And can you tell the ladies and gentlemen of the jury what kind of business GE Aviation is engaged in?

A. In aviation, so primarily aircraft engines, but also avionic systems on the aircraft.

Q. Do these technologies give GE Aviation a competitive advantage in the marketplace?

11:22:49 **A.** Yes, they do.

11:22:50 **Q.** What kind of technology are we talking about?

11:22:55 **A.** Again, primarily propulsion technology or the technology utilized for aircraft engines, and then also our avionic on-board systems. So a lot of engineering technologies that I'm not an expert in specifically that allow us to create very market competitive and leading aircraft engines and avionic systems.

11:23:18 **Q.** And to achieve that sort of competitive advantage, are there certain types of information that GE Aviation tries to protect from public disclosure?

11:23:27 **A.** Yes, there is.

11:23:29 **Q.** Okay. And is that where your job comes in?

11:23:31 **A.** That's correct. That's the primary responsibility of my role.

11:23:34 **Q.** All right. And if this non-public disclosure -- I'm sorry -- if this non-public information was disclosed, could it harm GE?

11:23:43 **A.** It could, yes.

11:23:45 **Q.** Now, we've been talking about the information and the data you protect broadly, but can you describe some of the categories of information without telling me the specifics of the technology, just the broad categories of types of information you store and protect?

11:24:02 **A.** Sure. So, again, as being an engineering company,

heavy on engineering information, so engineering designs, design processes, the practices around design, manufacturing, manufacturing processes, test data -- both of successes and failures, which are equally important -- and then obviously information around financials and business development or business plans for future growth as well.

Q. And so does your job include protecting information like testing data --

A. Yeah, it does.

Q. -- from public disclosure?

A. Sorry. Yes, it does.

Q. We briefly mentioned what you mean by cyber, but I wanted to make sure we understand the categories that you discussed here.

So you mentioned external threats being one of them?

A. Yes.

Q. Can you describe to the jury what you mean by external threats?

A. Yeah. So that would be any individual or group or organization that has interest in stealing the information that we were just discussing, those types or others, or interrupting our business operations, attempting to create downtime in the business' supply chain, but a heavy emphasis on understanding those threats that may be trying to steal our intellectual property.

11:25:25 **Q.** Okay. And when you say -- when you say they are trying
11:25:29 to steal, does that mean that they are outside of GE Aviation?
11:25:32 **A.** That's correct. So the external threats focus would be
11:25:35 focused on those individuals or groups that are outside of
11:25:39 GE Aviation, outside of our network, outside of our halls.
11:25:42 **Q.** And from a cyber security perspective, are you talking
11:25:46 about things like computer intrusion?
11:25:48 **A.** That's correct. So things like computer intrusions. I
11:25:53 think you heard in the news recently through techniques like
11:25:58 ransomware or phishing, which are very technical cyber
11:26:02 terms, but they are just used to describe different
11:26:06 techniques to, again, achieve the objective of trying to
11:26:09 interrupt business operations or to steal intellectual
11:26:12 property.
11:26:12 **Q.** Now, do you also work to protect data from internal
11:26:17 threats?
11:26:17 **A.** Yes, I do.
11:26:18 **Q.** Okay. And can you give the jury some examples of what
11:26:20 you mean by internal threats?
11:26:22 **A.** Yes. So an internal threat would be thought of as any
11:26:27 individual -- that may be an employee or a contractor or
11:26:30 anyone that has access to our environment from with inside
11:26:37 the company or with inside the walls -- is someone we would
11:26:42 consider an insider threat.
11:26:43 And my professional opinion is that the goal of an

external threat is to become an insider threat. So by compromising the network or a system to get in, to then have the same access that any insider would have.

Q. And so, broadly, how do you work to help GE protect information from nondisclosure, from public -- from disclosure to the public?

A. Sure. So there's a lot of techniques and different programs that we have. But a simple structure, I'd say we think about it as layers of an onion. So we have a bunch of different ways that we try to do that. So if you think about our network as almost like the perimeter or fencing of our company, we have a lot of different network controls and protections to be able to identify if there was an attempt or an intrusion, and we have technologies that help us with that.

THE COURT: I am going to interrupt you and encourage you to go slower.

THE WITNESS: Sure.

THE COURT: Every time you finish a sentence, pause before you go to the next sentence. The translator's reading furiously.

THE WITNESS: Sorry.

THE COURT: You're doing fine.

BY MS. GLATFELTER:

Q. Mr. Ridder, let me ask you a few questions. So you

said -- let's go through these so we make sure that we are going at a pace the translators can follow.

You made the analogy to the layers of an onion. So let's start with the outside layer. And I want to think -- I want to talk broadly too about other security measures.

So does GE Aviation use, you know, physical security to control access to its campuses?

A. Yes, we do.

Q. Okay. And can you give the jury some examples of what you mean by controlling the physical access to the campus?

A. Sure. And I can give an example what it would be like for me entering as an employee. So if I'm approaching the site in Evendale that we were discussing, that has a fenced perimeter around it. There are turnstiles as a way of entry where I have to swipe my badge to be able to get through a turnstile. There is also an area that you can enter where you have to show your badge to a guard if you're not going through the turnstile, to validate your badge and your employment.

Once inside of the perimeter, if I am to enter a building, again, I have to swipe my badge to be able to ensure I have access to that particular building.

And, additionally, if there are areas that have more restricted information, there's an additional level of swiping or badging to enter the areas where there may be

11:29:29 even more restricted discussions or information.

11:29:35 **Q.** Do you -- does GE -- strike that.

11:29:39 Are visitors able to enter the GE Aviation buildings on

11:29:44 campus?

11:29:45 **A.** Not without being previously registered and then being

11:29:49 escorted by an active employee.

11:29:52 **Q.** All right. So we covered the physical security. If we

11:29:55 go another level deeper and we talk about training, for

11:30:00 example, does GE Aviation provide any training to its

11:30:03 employees?

11:30:04 **A.** We do. We provide a lot of different training. We

11:30:08 provide training on the physical security measures we

11:30:12 mentioned and what is appropriate. For example, an area

11:30:16 that requires badging, you have to ensure that if you swipe

11:30:21 your badge, the person behind you is also swiping theirs.

11:30:25 That's a part of our training.

11:30:26 We additionally have training on our controls that are

11:30:33 implemented around our cyber security and data protections,

11:30:38 and trainings around safety and trainings around

11:30:40 understanding what is important data to the company, among

11:30:42 other things.

11:30:44 **Q.** So you train employees on what might be protected data?

11:30:47 **A.** Yes, that's correct.

11:30:52 **Q.** Okay. So we have gone through the physical security

11:30:54 layer, the training employees receive.

11:30:57 How does the protection of the digital -- of digital
11:31:00 information occur? Can you walk us through, you know, an
11:31:04 average employee logging on to their computer, for example?
11:31:07 **A.** Sure. So the average employee would have a computer
11:31:12 that they would, first, when they power up, be presented
11:31:17 with some information reminding them of their obligation to
11:31:21 protect the data and intellectual property that GE has.
11:31:26 They would then be required to enter a user name and a
11:31:31 password, and they would also be required to use another
11:31:36 factor of authentication. So a device that you would plug
11:31:42 into the computer or your cell phone as another way to
11:31:46 ensure you are whom you say you are. And then once that is
11:31:50 verified, you would then be given access into the
11:31:53 environment at a base level.
11:31:57 **Q.** Okay. You mentioned a device you could plug into your
11:32:00 computer or on your cell phone. Could you briefly describe
11:32:03 the technology you're talking about to the jury?
11:32:05 **A.** Sure. So that concept is referred to as two-factor
11:32:12 authentication. But what that really means is making sure
11:32:15 you have a combination of either something that you know,
11:32:19 something that you are -- if you think about your thumb or
11:32:24 your face as you may unlock personal devices with -- and
11:32:27 then something that you have. So the example of the little
11:32:32 USB device I was talking about that you plug in, that would
11:32:36 be an example of having something with you, as well as

something you know, being your user name and password.

Q. Okay. Thank you. Now, at more of a global level -- that's what an individual employee might encounter if they were working on a campus. At a global level, what do you do to ensure network security?

A. Yes. So we have a lot of different technologies that we use on individual users of the company's laptops or desktops that help identify what their activity is on that asset. We also have technologies that help us understand the activity on the network. And both of these technologies not only log that type of activity, they actually prevent and block certain activities -- for example, moving things off of the computer or trying to access things on the Internet that we may not want.

And then we also have additional controls before you are able to access some more of our -- or some of our more important data.

Q. Have you heard of a concept called "need to know"?

A. Yes.

Q. What does that mean for you as the VP of security working at GE Aviation?

A. Yeah. So what that means, a need to know, is that users are not permitted access unless they have a specific need to know that. So that means there may be multiple projects going on in the company, but you would only be

given access to a project if you needed to know that. And, more specifically, if there are files or data required for that project, you are controlled to have access only to what you need for your part of that project or that program.

So as a user, if I log in, I'm only presented with access to material that is required to do my job, and there are multiple levels of checks as you are attempting to access that information.

Q. So if you're an employee at GE, you're -- is another way of, I guess, understanding this process, if you're an employee at GE, you only have access to files that you need to do your work?

A. That is correct.

Q. Does someone who's working on -- I think you mentioned avionics at the beginning. So someone who's working on avionics, would they be limited in scope to what they could access about, you know, fan blade technology?

A. That is correct.

Q. Now, we've been talking about what happens on the GE campus or what happens at the GE workplace. What about a customer relationship or a supplier relationship? Does GE Aviation customers have access to sensitive, non-public GE information?

A. Not by default. If there is an instance where that would be required, that need-to-know principle is still in

effect. So if required, that would be reviewed by a GE person to then determine if that was to be approved and provide access, again, only if that was required.

Q. And you mentioned limitations. Would there be limitations on the access of a customer or a supplier?

A. Yes. They would, again, only be permitted access to what would be needed or required for that particular interaction or relationship.

Q. Okay. Does GE Aviation have joint venture business relationships?

A. Yes, we do.

Q. Does GE Aviation protect its sensitive and -- and information from public disclosure in those areas?

A. Yes, we do.

Q. How so?

A. As part of the joint venture, the way that that would usually work is each party is bringing something of value. So, for an example, there might be technology that is the value. That specific technology that was agreed to and in a contract determined what the joint venture should have access to is all that they would be permitted to access and would require all of the same controls and need to know as we would do with any other project internally or with any other customer relationship.

Q. And you said the access would still be limited to need to

know?

A. That's correct.

Q. So can you give us an example of that?

A. Yes. So we have a joint venture called Aviage, and that is a joint venture with GE Aviation and AVIC. That particular joint venture has technology around avionics. It is limited explicitly to that. And that joint venture is completely isolated from the GE network without any connections so the technology required for that is then transferred to be able to be utilized amongst that relationship, which, again, had to be -- continues to have to meet the requirements of both parties, but GE specifically for this example, has for that data to be utilized in that relationship.

Q. I think you mentioned something about a different network or a different server. What do you mean by that?

A. So what I mean by that is, for example, for that joint venture, you could think about it as a completely separate company. So if you think about maybe Kroger or Walmart, they are not going to have -- would not be connected or talking to each other; they would be separate entities. The joint venture would be set up in that way as well.

Q. So they would have their own separate network apart from GE's network?

A. That is correct.

11:38:29 **Q.** And in terms of the subject matter, it would be limited
11:38:32 in scope?
11:38:32 **A.** That is correct.
11:38:33 **Q.** All right. Are you familiar with the concept of
11:38:39 something called a file directory?
11:38:40 **A.** I am, yes.
11:38:41 **Q.** Can you explain to the ladies and gentlemen of the jury
11:38:46 what that is?
11:38:47 **A.** Yes. So with regards to a computer, a file directory
11:38:50 would be a listing of all the files and folders, including
11:38:55 the names of files, folders, and other detailed information
11:39:00 about everything that would be listed on that computer.
11:39:04 **Q.** Okay. And so someone who received a file directory, what
11:39:08 information would they receive?
11:39:09 **A.** Yes. So, again, you would receive the -- all of the
11:39:16 names of every file and every folder on there. You would
11:39:19 see the directory -- excuse me -- the file path or the way
11:39:26 to get to each one of those files. So it would show you,
11:39:30 stepping through the computer, how to get to each particular
11:39:36 folder and the file within it. It would also show you the
11:39:39 file size, so how big it is, which may be of interest
11:39:43 because a larger file size may be able to assume it has
11:39:46 pictures or videos in it.
11:39:49 It will also show you the last time that one of those
11:39:53 files was modified, which may be of interest to know if this

11:39:56 is something someone is currently working on or has worked
11:39:59 on in the past.
11:40:02 And it may, as is often done in the business world,
11:40:06 contain names or initials of individuals you're working with
11:40:10 or working for that you might be collaborating with in those
11:40:15 file names, as well as some other information as well.
11:40:19 **Q.** You referenced that this information would be
11:40:23 representative of -- strike that.
11:40:28 Is a file directory unique to a computer or to a device?
11:40:32 **A.** It is, yes.
11:40:33 **Q.** So when we're talking about creating a file directory,
11:40:36 you are talking about something that would be created about a
11:40:39 particular computer?
11:40:39 **A.** That is correct.
11:40:40 **Q.** All right. I'd like to show you Exhibit Number 70, which
11:40:43 has been admitted.
11:40:44 MS. GLATFELTER: And I'd like to publish it to the
11:40:46 jury, Your Honor?
11:40:47 THE COURT: You can show Exhibit 70 to everyone.
11:40:50 Publish.
11:40:53 MS. GLATFELTER: If we can go to the last page of
11:40:55 the exhibit.
11:41:02 THE WITNESS: I don't believe I have it currently in
11:41:03 front of me.
11:41:04 BY MS. GLATFELTER:

11:41:04 **Q.** Mr. Ridder, if you look at the screen --

11:41:05 **A.** Perfect. Thank you.

11:41:07 **Q.** -- you will see it there.

11:41:08 MS. GLATFELTER: And if we scroll down to the bottom.

11:41:10 BY MS. GLATFELTER:

11:41:13 **Q.** Do you see in that second box where it says "Step 1, Create Notepad document, txt format," and then there is a Step 2 there. Do you know what these steps are for?

11:41:27 **A.** I do, yes.

11:41:28 **Q.** What are these steps for?

11:41:29 **A.** These steps are the beginning to create a directory, as we were just discussing, of a particular computer.

11:41:38 **Q.** Based on your experience, can the information in a file directory be useful to someone who is an external threat, such as a hacker?

11:41:50 **A.** It is. As I was just describing some of the uses, and there is some other uses of this technique as well.

11:41:57 MS. GLATFELTER: If we can go to Exhibit 72. Just the attachment of 72.

11:42:10 THE COURT: This has been admitted?

11:42:13 MS. GLATFELTER: Yes, I'm sorry. It's admitted.

11:42:14 THE COURT: So to publish it?

11:42:17 MS. GLATFELTER: Yes, Your Honor.

11:42:18 And if we can go to the attachment, which I believe is

11:42:22 the next page.
11:42:27 BY MS. GLA0TFELTER:
11:42:28 **Q.** Mr. Ridder, are you able to see this on your screen?
11:42:29 **A.** Yes.
11:42:30 **Q.** Okay. What are we looking at?
11:42:33 **A.** So this would be the output of the instructions that we
11:42:38 were looking at on the previous page.
11:42:40 **Q.** I want to go through the details of this in a moment, but
11:42:44 have you seen this particular file directory before?
11:42:47 **A.** I have, yes.
11:42:48 **Q.** Did your team assist the FBI in creating it?
11:42:52 **A.** We did help create this document, that's correct.
11:42:57 **Q.** And does this file reveal some of the -- does it reveal
11:43:03 any contents of GE files?
11:43:05 **A.** It does reveal the names of files and folders and
11:43:11 material that would be found on that computer.
11:43:12 **Q.** But in terms of the content, does it contain the content
11:43:16 of any file that's listed here?
11:43:18 **A.** It does not. Just exclusively the name of files and
11:43:24 folders and materials on that.
11:43:25 **Q.** Using this first page, at the top of it, can you describe
11:43:29 some of the things that we see on the file directory?
11:43:34 MS. GLATFELTER: And I'd ask the Court's permission
11:43:36 to allow the witness to touch the screen to show which parts
11:43:40 he's using. Do we have that technology?

11:43:47 THE COURT: Sure.

BY MS. GLATFELTER:

Q. So, Mr. Ridder, in a moment, when you're describing a particular part, you will be able to, you know, circle it on your screen and the jury will see what you're referring to.

Let's start at the top. If we can look at the words "volume in drive C is windows" and the "volume serial number." What information does that convey?

A. So that is telling me -- if it's okay I'll go ahead and highlight?

Q. Yes.

A. So this is telling me that the --

Q. Actually, I think it's on my screen.

A. So where it says --

Q. That's okay. We can turn it off.

A. Sorry. So where it says "drive C," that's indicating that the name of the hard drive or the portion of the computer where these files and folders are stored is referred to as "C" in the document. And "Windows 7" is referencing that the operating system is the Windows 7 version.

Q. And what about "volume serial number"? What does that refer to?

A. So that is the unique identifier for that particular drive. If you think about like a VIN number on a car. That

11:45:31 is often what that is for.

11:45:33 **Q.** Okay.

11:45:34 THE COURT: Excuse me, counsel. Do you want us to recess to get this annotation working?

11:45:45 MS. GLATFELTER: I think it might be working, but if it's convenient, if the Court would like to do that, we can do that.

11:45:49 THE COURT: Is it working or would you like me to come down and straighten it out?

11:45:53 MS. GLATFELTER: I think we must have it figured out because something's highlighted.

11:45:57 THE COURT: So we're okay and you can proceed?

11:45:59 MS. GLATFELTER: Yes, Your Honor.

11:45:59 THE COURT: Very well. Do you want to test it? That thing you drew through the last time is cool.

11:46:09 THE WITNESS: Do you want me to --

11:46:10 BY MS. GLATFELTER:

11:46:10 **Q.** Yes. Where you see "volume serial number."

11:46:12 **A.** Okay. I will underline that.

11:46:14 **Q.** Success.

11:46:15 THE COURT: It's working.

11:46:17 MS. GLATFELTER: Thank you, Your Honor.

11:46:18 BY MS. GLATFELTER:

11:46:18 **Q.** And what does the volume serial number refer to?

11:46:21 **A.** That would be, again, a unique identifier for that

drive C or that storage area. Again, the analogy I would use is like a VIN number or vehicle identification number on a car.

Q. All right. Stepping back for a moment, you said that your team helped the FBI create this?

A. Yes.

Q. And was that a request that the FBI made of GE Aviation?

A. It was.

Q. And that came -- and how did it come to you?

A. That came as a request that was approved and relayed with the leadership in GE Aviation.

Q. So you were directed to do that, directed to create that or help the FBI on orders from your superiors?

A. That is correct.

Q. How long is this directory, do you know?

A. The overall size of it? It is fairly large. If printed, would be several pages. I don't know the exact length or size of it.

Q. All right. Does about 60 pages sound right?

A. It does.

Q. Did you -- how long did it take to create this?

A. It was a few days. I don't recall the exact amount of days. We wanted to make sure we were thorough on ensuring that any information that may actually be of harm for GE to go out was properly sanitized or removed. But we also

11:47:53 wanted to ensure we had time for it to be reviewed with the
11:47:57 leader of our engineering division, as well as our legal
11:48:00 team and the leadership team. And also to ensure it was not
11:48:06 very easily identified that we had done some of those
11:48:09 sanitation tasks. So that took a few days to make sure that
11:48:14 we felt confident that those objectives were met.
11:48:17 **Q.** Okay. And the purpose in going through that process was
11:48:20 to protect GE's information?
11:48:23 **A.** That is correct.
11:48:23 **Q.** Okay. Going back to this document. Can you describe for
11:48:29 us what these different columns mean on the directory?
11:48:33 **A.** Yes. So I will attempt to highlight one of the lines.
11:48:38 So if we look at this line here I'm underlining, that
11:48:43 is a date column. Most often in a Windows system is
11:48:48 identifying the last time a document or a file was modified
11:48:52 or updated. So if I continue at that line across, that
11:48:56 would imply this particular line was last modified 3-23-16
11:49:03 at 4:06 p.m.
11:49:06 If I go to the column that has the numbers in it, the
11:49:14 54,681 is identifying the size of that file in bytes. So
11:49:21 without getting too technical, that's a way to identify size
11:49:25 of data.
11:49:26 And then the column to the right of that is the name of
11:49:29 the file itself. It is separated by a dot, which after the
11:49:36 dot indicates which type of file. So if I circle this, that

11:49:41 did say "htm." That would identify to me that this is a
11:49:46 file for html, or the type of file that an Internet browser
11:49:53 would read for this particular example.
11:49:55 **Q.** And that middle column, I know it's missing there --
11:49:58 **A.** Yes.
11:49:58 **Q.** -- for a particular one you interviewed -- or, I am
11:50:01 sorry -- you underlined, but where it says "dir," what does
11:50:05 that refer to?
11:50:06 **A.** Indicating the directory of -- this is of the directory
11:50:12 with the longer title I'm going to underline here.
11:50:17 **Q.** I see. Thank you.
11:50:18 MS. GLATFELTER: If we could go to page 8. And if
11:50:29 we can scroll down just a little bit so more of the page is
11:50:33 full.
11:50:33 BY MS. GLATFELTER:
11:50:34 **Q.** I'd like to go through just a few examples of the types
11:50:37 of files that are contained in the directory.
11:50:40 You mention that -- you mention that this directory will
11:50:45 tell you different types of files. Can you give us an example
11:50:48 of -- can you explain that to us using the first line?
11:50:53 **A.** Yes. So the different types of file -- again, I will
11:50:58 underline this part, this ".pdf" -- this is indicating to me
11:51:04 that this is an Adobe pdf file. And then again if I
11:51:10 highlight over here, this is the name of the file continuing
11:51:16 onto this next line here, that would be, again, usually in

11:51:21 naming to describe what is likely the contents of the file.
11:51:24 **Q.** And so is the name of that file "VSE Fan Case Item Number
11:51:30 3 Tech Plans Process Flow Chart"?
11:51:33 **A.** That's correct.
11:51:33 **Q.** And how large is that file?
11:51:35 **A.** That would be identified here as 521,460 bytes.
11:51:44 **Q.** And if we scroll down to the middle -- or, I'm sorry --
11:51:50 at the bottom of your screen where it says the word
11:51:54 "requirements" on the left?
11:51:55 **A.** Yes.
11:51:55 **Q.** Do you see that?
11:51:56 **A.** Yes.
11:51:57 **Q.** I just lost it there.
11:52:08 MS. GLATFELTER: One moment, Your Honor.
11:52:09 BY MS. GLATFELTER:
11:52:09 **Q.** Do you see an example of a PowerPoint file in this
11:52:13 directory?
11:52:14 **A.** I am just looking for that now. Yes, I do.
11:52:23 **Q.** Okay. And where is that on the page? Can you underline
11:52:26 that for us?
11:52:26 **A.** Yes. The part that identifies it as a PowerPoint is
11:52:31 here, and then this would be the name of the file that is a
11:52:35 PowerPoint file (indicating).
11:52:38 **Q.** And is the name of that file "GE9x Trenchfiller Panel
11:52:47 VSE"?

11:52:47 **A.** Yes.

11:52:48 **Q.** Do you know generally what GE9x refers to?

11:52:52 **A.** That refers to one of our engines, GE9x.

11:52:56 **Q.** One of the newest models?

11:52:57 **A.** That's correct.

11:53:01 **Q.** All right. Does the file directory identify the location of the files?

11:53:04 **A.** It does, yes.

11:53:05 **Q.** Okay. And can you describe what you mean by that to the jury?

11:53:09 **A.** Yes. So if I -- again, I'll highlight here. This is where this file is stored on the computer. So the way that I would think about this is like the -- within a neighborhood that I would refer to as C, or the storage device, this user's dash number, dash the rest of that file would be the address that would show you the specific location of the document requirements, or the -- excuse me -- within the folder structure of the computer.

11:53:45 **Q.** So if someone -- if someone received this file but didn't have the computer yet that it belonged to, would they be able to use this to locate the file when they received it?

11:53:57 **A.** Yes.

11:53:58 **Q.** And how would they do that?

11:53:59 **A.** Again, by reading this string that I just underlineded -- excuse me -- underlined, they would see that

it is on the part of the hard drive called C in "folder users" and then so on. So they would know exactly where to locate that specific file.

Q. And is that the -- based on your experience at GE Aviation, is that the type of information that intruders have tried to obtain in the past?

A. Yes.

Q. Now, what would happen if someone outside of GE Aviation got ahold of a GE laptop of an engineer?

A. Well --

Q. What could they access?

A. They would have access to any of the files that would be stored on that computer, inclusive of some of the information that we are looking at here. That could contain and likely would contain a lot of the information we discussed earlier, depending on their particular role, but around our engineering designs, practices, processes, test information -- again, depending on their role.

Q. And if an outsider gained access to a GE laptop, could it cause economic harm to GE Aviation?

A. Yes.

MS. GLATFELTER: One moment, Your Honor.

THE COURT: Very well.

(Pause.)

MS. GLATFELTER: No further questions, Your Honor.

11:55:30 THE COURT: Very well. We're almost at lunchtime.
11:55:39 Do you have a preference, Mr. Kohnen? Do you want to start or
11:55:44 do you want to break for lunch now?
11:55:46 MR. KOHNEN: Your Honor, I expect that I will
11:55:47 probably take at least a half an hour, perhaps 45 minutes to
11:55:52 an hour, so it might be a good time to break for lunch.
11:55:55 THE COURT: Very well. We'll take our lunch break.
11:55:58 It's almost time. We'll break until 1:15.
11:56:02 During the break, enjoy your lunch. Don't discuss the
11:56:05 case among yourselves or with anyone else. No independent
11:56:09 research. Continue to keep an open mind.
11:56:12 Out of respect for you, we will rise as you leave.
11:56:17 THE COURTROOM DEPUTY: All rise for the jury.
11:56:19 (Jury out at 11:56 a.m.)
11:56:50 THE COURT: The jury's left the room. The door is
11:56:57 closing.
11:57:01 I am prepared to recess, maybe come back a little earlier
11:57:04 and chat with you outside the presence of the jury. I told
11:57:07 them we would get them at 1:15. If you could be here at 1:05,
11:57:13 I will come out and talk to you.
11:57:16 Are you ready to recess at this time from the
11:57:18 government's perspective?
11:57:19 MS. GLATFELTER: Yes, Your Honor. Thank you.
11:57:20 THE COURT: The defense as well?
11:57:22 MR. KOHNEN: Yes, Judge.

11:57:23 THE COURT: During the recess, sir, please do not
11:57:26 discuss the testimony you have given. In the spirit of full
11:57:29 disclosure, I have never seen anybody draw a better red line.
11:57:33 THE WITNESS: Thank you.
11:57:33 THE COURT: Thank you.
11:57:33 THE COURTROOM DEPUTY: The court is now in recess.
11:57:35 (Lunch recess from 11:57 a.m. until 1:11 p.m.)
01:11:10 THE COURT: We're a few minutes from getting the
01:11:12 jury. We're back in the open courtroom on the record. The
01:11:15 jury's not here. I wanted to talk to the lawyers.
01:11:19 In response to the Court's ruling this morning about a
01:11:23 curative instruction, the government raised a valid point
01:11:28 regarding the use of the term "trade secret." Specifically
01:11:34 the term "trade secret" has a legal definition, and so when a
01:11:40 witness is asked about a trade secret, there is no guarantee
01:11:43 as to whether the witness' understanding of the trade secret
01:11:47 matches the legal definition.
01:11:49 Moreover, the question in and of itself calls for a legal
01:11:53 conclusion. So if the question prompted an objection each
01:11:58 time it is asked, I think I would need to sustain that
01:12:02 objection -- the question calls for a legal conclusion -- and
01:12:09 tell the defense to either rephrase it or I would need to
01:12:12 instruct the jury each time that I will instruct them on the
01:12:16 law and the witness can't answer.
01:12:17 The government proposes that the defense should refrain

01:12:20 from asking about a trade secret by name and instead phrase
01:12:26 its inquiries using the actual definition of trade secret. I
01:12:31 think that's a fair point, but my hesitation is that the legal
01:12:34 definition is fairly lengthy and it would be awkward to phrase
01:12:40 a question around that definition.
01:12:42 But perhaps we could significantly pair down the
01:12:46 definition. I wonder if rather than asking are these trade
01:12:54 secrets, if the question could be asked in two parts: Did X
01:13:01 company generally keep any of this information secret? If the
01:13:04 answer's no, the point is made -- if the answer is no, the
01:13:11 point's made. If the answer is yes, they generally kept it
01:13:16 secret, then the second part of the question is was keeping
01:13:23 the information secret important to ensuring that others
01:13:26 cannot profit from them, or something to that effect.
01:13:31 It's muddled, but I think I need to explain that, there
01:13:35 having been no objections previously, I am forced to conclude
01:13:39 that asking a lay person whether there are any trade secrets
01:13:43 here calls for a legal conclusion that that witness cannot
01:13:48 answer, and I would have to jump in each time it was used.
01:13:55 What's the defense make of all of this?
01:14:00 MR. KOHNEN: Your Honor, I think I'd like an
01:14:04 opportunity -- I'd like an opportunity to consult with my
01:14:08 colleagues on the question, Judge. I think my visceral
01:14:12 reaction, if you will forgive me, is I think the Court might
01:14:16 be unintentionally leading us down a bit of a slippery slope.

01:14:21 And here's why: We're now blending law with facts. I think
01:14:28 that's going to confuse the jury. And here's a great example.
01:14:33 On October 25th, October 26th, and October 27th, there were
01:14:38 three meetings or one long three-day meeting, however you want
01:14:42 to look at it, at the General Electric Aviation Response
01:14:45 Center. The meetings included engineers, but the meetings
01:14:50 also included lawyers, and the meetings obviously included
01:14:57 what GE considered to be proprietary information. We've heard
01:15:02 that term a great deal, as the Court's aware.
01:15:04 At the end of the day, the consensus from the head
01:15:10 engineer, a German fellow whose name I've forgotten, was that
01:15:14 no proprietary information got out from Mr. Zheng's
01:15:22 PowerPoint, no trade secrets had been revealed. Now, I don't
01:15:25 know what definition they were using. We had a collection of
01:15:29 engineers, special agents, and lawyers, but to expect anybody,
01:15:36 including lawyers in this case, to have a consistent opinion
01:15:40 on what a trade secret is or should be or may be is fraught
01:15:44 with peril.
01:15:45 THE COURT: It's what?
01:15:47 MR. KOHNEN: It's dangerous.
01:15:48 May I consult?
01:15:49 THE COURT: Yes. I'm just trying to avoid having to
01:15:55 cut off the defense each time the phrase "trade secret" is
01:16:00 used. And I'd like to hear from the government, but I guess
01:16:03 the defense needs to caucus.

01:17:21 (Pause.)

01:17:24 MR. KOHNEN: Your Honor, we understand and share
01:17:26 your concern. Honestly, we do. We're not sure that there is
01:17:30 an answer. We think that if we use the word "trade secret"
01:17:37 and the conditions are appropriate, it's not -- we think that
01:17:40 if we ask a question about trade secrets and it's not obvious
01:17:43 what we're asking, we could define it for the witness first or
01:17:46 ask the witness to define it or just stay the heck away from
01:17:50 the words "trade secret." And we'd like to give that a try.
01:17:54 THE COURT: And what?
01:17:55 MR. KOHNEN: And we'd like to give that a try. And
01:17:57 part of the reason for that, Judge, is we think probably
01:18:00 there's only going to be one more witness of substance on the
01:18:05 issue, and Mr. McBride has indicated that he can be as careful
01:18:12 as possible to avoid the situation that the Court describes.
01:18:16 THE COURT: Well, I appreciate your willingness to
01:18:21 work this through, and if you avoid using "trade secret," I'm
01:18:24 happy. If you use "trade secret," I think I'm going to be
01:18:27 compelled to interject, "That calls for a legal conclusion.
01:18:31 This witness is not a lawyer, can't make a legal conclusion.
01:18:37 Can't even opine. And I will tell you, jury, what the
01:18:41 definition of a trade secret is, and you will abide by it."
01:18:46 And I was trying to give you an approach, is it a secret?
01:18:56 Was it an advantage to keep it a secret? But if you are going
01:19:00 to stay away from "trade secret," great. If you're not, I'm

01:19:03 going to have to interject as I indicated.

01:19:07 MR. KOHNEN: Judge, we have been so advised, and we will follow your suggestion. And we also understand that if we fail to do that, you will see to it that the matter's corrected.

01:19:20 THE COURT: Let the record reflect you're smirking at me on that last sentence and that I'm smirking back at you, so we're even.

01:19:27 MR. KOHNEN: That's a sign of respect, Your Honor. Thank you.

01:19:29 THE COURT: Does the government wish to be heard further on the issue, Ms. Glatfelter?

01:19:30 MS. GLATFELTER: No, Your Honor. And we appreciate the clarification. Thank you.

01:19:35 THE COURT: Very well. Are we ready for the jury from the government's perspective?

01:19:38 MS. GLATFELTER: Yes. Would it be permissible to have our witness come in the room now?

01:19:43 THE COURT: Yes. Let's get the witness so we don't have to wait. We talked about that.

01:19:49 Is the defense ready?

01:19:55 MR. KOHNEN: Yes, Your Honor.

01:19:56 THE COURT: Let's call for the jury. It will take a couple of minutes.

01:20:01 The witness can come on back up to the hot seat. We've

01:20:05

01:20:22

called for the jury.

So, Mr. Witness, you are doing great, but I really need you to go slow.

THE WITNESS: Sure.

THE COURT: Try and pause every time you hear a period.

THE WITNESS: Will do.

THE COURTROOM DEPUTY: All rise for the jury.

(Jury in at 1:21 p.m.)

THE COURT: You may all be seated.

The 15 members of the jury have rejoined us after the lunch break. Welcome back. Thank you for your work.

We'll continue to hear testimony from this witness. At this stage the defense has an opportunity to ask questions.

The witness remains under oath.

Mr. Kohnen.

MR. KOHNEN: Thank you, Your Honor.

THE COURT: Yes.

CROSS-EXAMINATION

BY MR. KOHNEN:

Q. Mr. Ridder, with the Court's permission I am removing my mask, and I think the judge would be amenable to you doing so if you want to as well.

THE COURT: You don't have to. If you want to, you can.

BY MR. KOHNEN:

Q. I just find it makes it easier for me to be heard, and you're doing fine. You're being heard, you know.

A. I'm happy to speak loudly, but for some personal family health reasons, I'll keep mine on. But thank you.

Q. I completely understand.

THE COURT: And you'll keep your voice up, Mr. Kohnen.

MR. KOHNEN: I will, Your Honor.

BY MR. KOHNEN:

Q. Mr. Ridder, I am not as technically savvy as Ms. Glatfelter is, especially after hearing her direct exam of you, nor am I apparently as tech savvy as the Judge is, but I hope you'll bear with me on this stuff.

One of the things I wanted to get right after really is this directory that was created, or I'll use the word "fabricated" if you'll excuse the pun.

Records reveal that the FBI got that directory from you on or about February 14th of 2018. Does that sound about right?

A. It does.

Q. And we heard Special Agent Hull testify that he had requested it sometime before that. And we now understand from your testimony what went on in the interim between the request and your sharing it with him.

What I want to get to is a couple of things. Number one, we keep talking about a directory, but we're talking about a directory like a table of contents. In other words, it's the table of contents, but the pages to the book aren't there. Is that a fair analogy?

A. I would say that that listing is again a list of the file names and the file folders. Does it reveal the contents of those files or folders? It does not, but it does describe in many cases what you may see in there.

Q. Fair enough. So they're the titles?

A. They are the names of the documents.

Q. Okay. Now, you testified that you prepared this thing, and I want to get into a little bit of the detail. Did you start with Mr. Zheng's original directory?

A. Yes, we did.

Q. Okay. And did you -- you were doing this, as we went over it, at the suggestion of the FBI, right?

A. With approval from the leadership and legal team, yes.

Q. My point is the request came from the FBI, correct?

A. That is correct.

Q. Okay. And it came from Special Agent Hull, I assume?

A. I believe so.

Q. Okay. Was anybody else from the FBI involved?

A. I don't recall the specific members at that time. It was many years ago.

01:25:21 **Q.** Okay. How did they ask? How did they approach you and
01:25:24 tell you what they wanted?
01:25:26 **A.** The request was made in front of the leadership team
01:25:32 and the legal team with GE Aviation, which we then -- they
01:25:37 had a discussion about outside without the FBI presence and
01:25:41 then provided me the direction.
01:25:43 **Q.** Okay. So this was a meeting; is that fair?
01:25:46 **A.** Yes.
01:25:48 **Q.** Okay. And who was at the meeting? You mentioned GE
01:25:51 leadership, and I don't think I necessarily need anymore
01:25:55 names. You're kind of the top of the ladder I'm interested in
01:25:59 climbing, but what about from the FBI? Who was there from the
01:26:02 FBI?
01:26:02 **A.** To be honest, I don't recall who the members were that
01:26:06 were there in that meeting.
01:26:07 **Q.** Okay. Can you describe for the jury what the pitch was,
01:26:11 what the ask was, and how they presented this to this
01:26:15 assembled group at GE Aviation?
01:26:18 **A.** Well, since the ask had come in from the defendant, the
01:26:24 request was if we would be willing to provide something that
01:26:30 would have this type of information in it. And for us to
01:26:34 understand internally what the risk was, was a conversation
01:26:39 we had separately.
01:26:40 **Q.** Okay. So you said that the ask came in from the
01:26:46 defendant. I don't want to get into that too much, but at

01:26:52 least we believed that the FBI was keeping you apprised of
01:26:54 their investigation; is that fair?
01:26:55 **A.** I was in some meetings where there were some
01:26:58 discussions of that, but I was not in every one of those
01:27:01 meetings.
01:27:01 **Q.** Yeah. And we'll get to that in a minute. But what I
01:27:05 want to focus on is this meeting when they asked you to
01:27:11 fabricate, as I said, or create, or edit Mr. Zheng's
01:27:18 directory, right? Did they tell you what they wanted the
01:27:22 directory -- what they wanted to accomplish with the
01:27:27 directory, what they wanted the directory to do to the person
01:27:30 who reads it?
01:27:32 **A.** I don't recall those details, to be honest, but there
01:27:35 wasn't a direction of what the end state, like the full
01:27:40 details of that was not part of the discussion I recall.
01:27:45 **Q.** Okay. Did they -- did they leave you with the conclusion
01:27:51 that they were preparing bait; that they were baiting a hook,
01:27:57 so to speak?
01:27:58 **A.** I don't recall that being a particular part of the
01:28:03 discussion. There were discussions about what the potential
01:28:07 risks might be that we talked about GE Aviation in the
01:28:10 company. I don't recall the full details of the discussion,
01:28:13 to be honest.
01:28:14 **Q.** You know, Mr. Ridder, if I were you, I would be focused
01:28:20 on the risks to GE Aviation also.

MS. GLATFELTER: Objection, Your Honor. Argumentative.

THE COURT: Questions for the witness, please.

MR. KOHNEN: I'm sorry?

THE COURT: Questions for the witness, please.

MR. KOHNEN: Very well, Your Honor.

BY MR. KOHNEN:

Q. Mr. Ridder, I understand where you're focused, but what I'm asking is for you to look away from your focus for a minute and try to recall what it is the FBI said they wanted in that directory.

MS. GLATFELTER: Your Honor, objection.

THE COURT: And the basis?

MS. GLATFELTER: Asked and answered several times.

THE COURT: You can ask it again.

THE WITNESS: I'm sorry?

THE COURT: You can answer the question.

THE WITNESS: I'm being truthful. I honestly don't remember the specifics of the meeting that took place several years ago.

BY MR. KOHNEN:

Q. Okay. That's fair. Do you remember anything in particular that was added to the directory?

A. I don't recall, to be honest.

Q. Do you remember anything in particular that was deleted

from the directory?

A. I don't recall the specific names of files, but there were files or folders that we deleted from there that we thought may have information that would be sensitive to GE.

Q. I understand that. Is there anything else that you recall that was deleted?

A. Not that I can remember.

Q. Was this directory designed to look as if it actually was Mr. Zheng's directory? Was that the objective?

A. Yes, it was.

Q. And was it designed or assembled so that new items, things that were added to the directory would be appealing to someone who you understood would be interested in the content behind the directory?

A. To be honest, that would be out of my expertise. That was something that was -- the contents of the files and the specific file names that would be allowed to be in there or not was a discussion with the leader of engineering.

Q. Okay. What about Special Agent Hull? Didn't he tell you what he would like to see in the directory?

A. I do not recall that being the case.

Q. Did anybody from the FBI suggest or okay or collaborate on what the directory might trick a person into believing the contents were?

A. Again --

01:30:39 MS. GLATFELTER: Objection, Your Honor.

01:30:40 THE COURT: Yes?

01:30:42 MS. GLATFELTER: Argumentative.

01:30:45 BY MR. KOHNEN:

01:30:45 **Q.** Did anybody from the FBI have any role in the directory that you testified you made up and changed?

01:30:51 **A.** So nobody of the FBI was with me or my team while we were creating that document.

01:31:01 **Q.** I want to be clear, if I wasn't clear before. This was just a directory. There wasn't a hard drive that it actually -- whose content it actually reflected, right?

01:31:15 **A.** Are you referring to the document we've been discussing?

01:31:18 **Q.** Yeah.

01:31:19 **A.** Yeah, that file did not contain the -- did not contain actual files or folders from a computer. It was a listing of files and folders on the computer.

01:31:30 **Q.** All right. We've seen reports that indicate that you and the engineers you've referred to said that any data released would not --

01:31:45 MS. GLATFELTER: Objection, Your Honor.

01:31:46 THE COURT: Excuse me. Objection?

01:31:48 MS. GLATFELTER: Hearsay and improper impeachment.

01:31:51 THE COURT: Hearsay and improper impeachment.

01:31:56 Sustained.

MR. KOHNEN: I'll ask the question -- a different question, Your Honor.

THE COURT: Very well.

BY MR. KOHNEN:

Q. Did you assure the FBI that -- on behalf of your company, that any data released would not compromise any of GE's equities?

A. I don't recall that specific conversation, but my objective in creating that was to make sure that any of those files or folder names did not release any specific information about, you know, our technologies in themselves that might not be known.

Q. Okay. When news of this investigation leaked out, there was an assurance by General Electric that none of their information had been compromised. Are you aware of that?

A. I don't recall the specific communication that was given publicly at the time to know the exact wording of that.

Q. Do you remember it generally?

A. I do remember generally.

Q. And the United States Attorney himself commented likewise. Do you remember that?

A. Yes.

Q. Okay. Now, with respect to this directory, did it contain titles or whatever the description is, whatever you

call the description, that would lead the reader to believe that there was GE proprietary information contained within the hard drive it was describing?

A. On that file directory we looked at, there are file names that you would come to that conclusion. Which ones were created and which ones were on there at the time, I don't know the specific difference from memory.

Q. Okay. Now, there's a certain material that Mr. Zheng accessed that the jurors have heard about. And that material, as we understood -- as I understood the testimony, was stuff that was not allowed to be kept on an employee's hard drive. Are you familiar with the material I'm talking about generally?

A. Generally, I'm familiar with some of the material that was on there.

Q. Right. So there were four or five items. I think they were pdf's --

MS. GLATFELTER: Your Honor, objection.

THE COURT: Basis?

MS. GLATFELTER: Scope.

May I have a sidebar, please? If necessary.

THE COURT: Did you ask for a sidebar?

MS. GLATFELTER: Yes, Your Honor. If necessary.

THE COURT: Come on down.

MS. GLATFELTER: Thank you.

01:34:33 (At sidebar.)

THE COURT: Ms. Glatfelter.

MS. GLATFELTER: Yes. Mr. Kohnen's inquiring about meetings that happened in relation to Mr. Zheng. This was not a subject of direct examination. He, I think, is going into the area of asking what the conclusion of the meetings with the engineers were. Agent Hull has already conceded on the stand that there was no trade secret.

THE COURT: That there was?

MS. GLATFELTER: There was not a trade secret disclosed in the presentation given in China. They were export controlled materials. So not only is this outside the scope of direct, but this is irrelevant and it's misleading because it's about Mr. Zheng and what happened to him as opposed to the defendant who is on trial and his files. So we're conflating the file directory with what was on Mr. Zheng's computer at a completely different time.

MR. KOHNEN: Judge, Ms. Glatfelter's giving me more credit than I deserve. Right now I'm still trying to get to the things that were used by this witness in the composition of the directory, and I'm trying to get him to tell us what was in the directory that would have been of interest to readers such as Mr. Xu.

The pdf's came up because they are information that Mr. -- that Mr. Zheng actually downloaded. Actually ran

01:40:51 through his computer. I can use another example, but what I
01:40:51 want to demonstrate is that this witness put on that directory
01:40:51 an access path to material that is not supposed to be kept on
01:40:51 GE engineer hard drives. I think that's important.
01:40:51 THE COURT: Is there a distinction, perhaps?
01:40:51 MS. GLATFELTER: I don't understand actually his --
01:40:51 I don't understand his argument.
01:40:51 THE COURT: You're saying that you think they put on
01:40:51 the directory things that an employee should not have in his
01:40:51 computer?
01:40:51 MR. KOHNEN: I do. But that the employee can access
01:40:51 through that computer on GE's servers -- from GE's servers.
01:40:52 MS. GLATFELTER: None of that -- none of this was
01:40:52 done. The witness has answered this several times. And these
01:40:52 questions are now -- now, if that's the purpose of the
01:40:52 questions, they're misleading.
01:40:52 He's already answered the question, the FBI had no -- no
01:40:52 participation in making this document. They made it
01:40:53 internally based on what was going to be released and
01:40:53 concerned about that --
01:40:53 THE COURT: And he made up the directory, and one of
01:40:53 the items was something that's not allowed to be stored on a
01:40:53 GE computer. Is that the thrust of your line of inquiry?
01:40:53 MR. KOHNEN: Yes.
01:40:53 MS. GLATFELTER: If that's where he's going. I

01:40:53 mean, he was referencing the meetings and the engineer
01:40:53 meetings, so --
01:40:53 THE COURT: That was a valid objection and valid to
01:40:53 have a sidebar.
01:40:53 MS. GLATFELTER: Thank you, Your Honor.
01:40:53 THE COURT: Do you want to be heard?
01:40:53 MS. FRANKIAN: Can I ask something?
01:40:53 (Pause.)
01:40:53 THE COURT: Mr. Kohnen, why is that line of inquiry
01:40:53 relevant?
01:40:53 MR. KOHNEN: Judge, this is bait.
01:40:53 THE COURT: This is?
01:40:53 MR. KOHNEN: Bait. They are putting this out there
01:40:53 to lure the guy.
01:40:53 THE COURT: I get that, okay.
01:40:53 MR. KOHNEN: To lure someone. The sexier the stuff
01:40:53 on the directory, the sexier the stuff that's available
01:40:53 through that hard drive makes it more appealing. It's more
01:40:54 bait or sweeter bait, if you will, and I think the jury is
01:40:54 entitled to know just what lengths these folks went to to get
01:40:54 that bait in the pot.
01:40:54 MS. GLATFELTER: Well, that is disingenuous because
01:40:54 this was created at the defendant's request. He sent an email
01:40:55 asking for the creation of a file directory. They used --
01:40:55 they created the file directory, and they sent it, and so now

we are changing arguments here midstream.

THE COURT: I am going to stop. You can ask the question, was there stuff added -- do you know if there was stuff added to the directory that included stuff that a GE employee would not be allowed to have on his computer, and then move on.

I think you've exhausted the line of questions as to his role. He doesn't remember.

So one question in that regard. I'll see you in court.

(In open court.)

THE COURT: Okay, you can proceed.

MR. KOHNEN: Thank you, Your Honor.

BY MR. KOHNEN:

Q. Mr. Ridder, I'm going to try to ask my question a little more clearly.

THE COURT: Keep your voice up please.

MR. KOHNEN: Very well, Your Honor.

BY MR. KOHNEN:

Q. Was there anything on the hard drive that you fabricated that indicated access to material that should not have been kept on the computer of an engineer like Mr. Zheng?

A. That is beyond my expertise. That would be an answer better for the engineering team.

Q. Mr. Ridder, you're the vice president of cyber security?

A. That's correct.

01:41:41 **Q.** You don't know what engineers are allowed to have on
01:41:45 their hard drives and what they're not?
01:41:47 **A.** I don't know what each specific engineer is supposed to
01:41:51 have on what -- their computer at that specific point in
01:41:55 time. At the file level, the answer would be no, not for
01:42:00 all of the thousands of engineers that we have.
01:42:06 **Q.** Okay. So this was February of 2018. I think we heard
01:42:13 from prior testimony that it was February 14th, Valentine's
01:42:18 Day, when you guys turned over the directory to the FBI. Does
01:42:21 that sound right?
01:42:22 **A.** I don't remember the specific date, but it sounds
01:42:26 around the right time.
01:42:27 **Q.** Okay. And you said that there was a meeting before that.
01:42:33 I wasn't clear on how far precisely in advance of February
01:42:38 14th you think that meeting at least might have taken place.
01:42:41 **A.** I don't recall specifically, but at least a few days.
01:42:45 **Q.** Okay. All right. And you were cooperating with the FBI,
01:42:49 right?
01:42:49 **A.** I was. At the direction of my leadership, I was
01:42:55 following the directions that we had, that's correct.
01:42:57 **Q.** Well, I mean, you met with the FBI several times before
01:43:01 that, right?
01:43:02 **A.** That is correct. But my directions came directly from
01:43:07 my leadership team at GE, not from the FBI.
01:43:21 MR. KOHNEN: May I have a moment, Your Honor?

01:43:23 THE COURT: Yes.

01:43:43 (Pause.)

01:43:43 BY MR. KOHNEN:

01:43:44 **Q.** Mr. Ridder, it looks like, from what we've learned, that

01:43:54 you either met with or separately communicated with FBI Agents

01:44:01 Hull, Reigle, and sometimes Supervisory Special Agent Murphy

01:44:08 on at least 11 occasions between September -- I'm sorry --

01:44:13 July of 2017 and November of 2017. Does that sound about

01:44:18 right?

01:44:18 **A.** It does.

01:44:19 **Q.** Okay. When did you first hear about the investigation

01:44:26 involving Daihu, also known as David Zheng?

01:44:35 **A.** I believe that was sometime in July of 2017.

01:44:40 **Q.** Okay. Our information is that on July --

01:44:44 MS. GLATFELTER: Objection, Your Honor.

01:44:45 BY MR. KOHNEN:

01:44:46 **Q.** -- July 10 --

01:44:47 THE COURT: Excuse me?

01:44:48 MS. GLATFELTER: Objection, Your Honor.

01:44:49 THE COURT: Basis?

01:44:52 MS. GLATFELTER: Form and improper.

01:44:52 THE COURT: Sustained as to form.

01:44:56 BY MR. KOHNEN:

01:44:56 **Q.** Would July 10, 2017, sound like about the right time for

01:45:01 this first notice of yours?

01:45:02 **A.** I don't recall the specific date, but I do recall it being in July.

01:45:06 **Q.** Okay. Do you recall a meeting with a gentleman named Huffman Handler and yourself regarding Mr. Zheng?

01:45:22 **A.** We had multiple meetings. I am not sure which one you are referring to specifically.

01:45:27 **Q.** I am referring to the one I believe, at least, was on July 10th of 2017. Does that sound right?

01:45:34 **A.** I do not recall the specific date of those meetings.

01:45:37 **Q.** Well, you participated in a phone call with the FBI after the meeting I'm talking about; is that correct?

01:45:41 THE COURT: Keep your voice up.

01:45:42 THE WITNESS: Again, I don't recall. Quite possibly, but I don't recall.

01:45:47 BY MR. KOHNEN:

01:45:48 **Q.** Okay. Did you do an initial review of Mr. Zheng's GE-issued computers at about the time we're talking about?

01:45:57 **A.** We -- yes, we did a review after this information.

01:46:04 **Q.** And did you report in any way, shape, or form the results of that initial review to the FBI?

01:46:09 **A.** I reported that to the leadership team that we have.

01:46:14 **Q.** So you didn't participate in a call with the FBI after that initial review?

01:46:19 **A.** After that initial review, we reviewed it internally as a company, and we then shared the findings that we had at

that time.

Q. Shared the findings. "We," including you?

A. Yes.

Q. By phone with the FBI mid July 2017; is that fair?

A. I don't recall if it was over the phone or not. But, yes.

Q. Okay. Do you recall a meeting that took place the next day at GE Aviation and eight GE Aviation employees were there along with the agents, the FBI agents?

A. That -- I don't remember that specifically, but that does sound like that would have occurred.

Q. Okay. There was a fellow named Carl Bowman who was Mr. Zheng's supervisor that was there. Does that refresh your recollection a little bit?

A. It does not, no.

Q. Okay. Supervisory Special Agent Joshua Murphy was there, and he ended the meeting by saying something along the lines of not enough information that's been --

MS. GLATFELTER: Objection, Your Honor.

THE COURT: Sustained, sustained, sustained, sustained.

BY MR. KOHNEN:

Q. Do you remember the meeting?

A. I honestly don't recall the specifics of that meeting.

Q. All right. Two weeks after -- approximately two weeks

later, a number of emails that had been accessed through GE's servers, email addresses were shared with the FBI. Do you remember doing that?

A. I do not remember doing that.

Q. There was a two-day meeting in mid August where more detailed results of --

MS. GLATFELTER: Objection, Your Honor.

THE COURT: Basis?

MS. GLATFELTER: Counsel's testifying. He's been testifying for the last few minutes when he's supposed to be asking questions.

THE COURT: Sustained as to form.

BY MR. KOHNEN:

Q. Do you remember meeting over two days with special agents of the FBI and reporting to them on your analysis of Mr. Zheng's three GE-issued computers?

A. I recall having shared those findings. I don't recall whether it was over a two-day meeting or not.

Q. Do you recall who actually did the forensic analysis of the hard drives?

A. I don't recall the specific person, but it would have been somebody on my team.

Q. Was it Taylor Lord maybe?

A. Yes, that was quite possibly.

Q. Gordon Myers?

01:48:56 **A.** Yes, that would also be another member.

01:49:00 **Q.** And then there was a meeting, a big meeting at the

01:49:08 response center, I think it's called, on October 25th, 26th,

01:49:12 and 27th, which I mentioned previously.

01:49:15 THE COURT: Keep your voice up please or stand

01:49:17 closer to the microphone.

01:49:18 BY MR. KOHNEN:

01:49:18 **Q.** Did you attend that meeting?

01:49:19 MR. KOHNEN: Sorry, Your Honor.

01:49:21 THE WITNESS: I apologize. Could you repeat the

01:49:23 beginning of that?

01:49:23 BY MR. KOHNEN:

01:49:23 **Q.** Yes. I mentioned a meeting that took place over three

01:49:26 days or three meetings over three consecutive dates on October

01:49:31 25th, October 26th, and October 27th of 2017. Did you attend

01:49:34 that meeting or any one of those days?

01:49:37 **A.** I don't recall what specific meetings I attended at

01:49:41 that --

01:49:41 **Q.** Okay.

01:49:41 **A.** -- throughout those days.

01:49:45 **Q.** That takes us to November 1st of 2017. Did you

01:49:50 participate in an interview of Mr. Zheng with somebody named

01:49:56 Stephen Schwarz on that date?

01:49:59 **A.** I don't recall if that was the specific date, but I did

01:50:01 participate in an interview.

01:50:02 **Q.** Okay. Can you tell the jury a little bit about that
01:50:05 interview?
01:50:08 **A.** We were having an interview with, as you mentioned, the
01:50:13 employee Zheng, and the intention of understanding any
01:50:17 intellectual property information that he may have shared
01:50:22 that would be GE's intellectual property.
01:50:32 MR. KOHNEN: If I may have just a moment, Your
01:50:34 Honor.
01:50:35 THE COURT: Yes.
01:50:53 (Pause.)
01:50:53 BY MR. KOHNEN:
01:50:53 **Q.** Okay. Who did you interview Mr. Zheng with?
01:51:03 **A.** The other person in the interview at that time, is that
01:51:08 the question?
01:51:08 **Q.** Yeah.
01:51:09 **A.** Yes, Steve Schwarz.
01:51:11 **Q.** Steve Schwarz. And who is Steve Schwarz?
01:51:14 **A.** Steve Schwarz is a member of the global security team
01:51:17 at GE Aviation.
01:51:19 **Q.** During that meeting, did you take the lead or did
01:51:23 Mr. Schwarz in asking Mr. Zheng questions?
01:51:25 **A.** I don't recall there being a specific lead. There was
01:51:28 some questions that I wanted to ask and better understand
01:51:31 with the usage of his GE and other technology. And Steve
01:51:36 Schwarz had questions that he was asking as well too.

01:51:40 **Q.** Okay. Before that interview, shortly before that
01:51:46 interview, had you spoken with Special Agents Hull and Reigle
01:51:50 from the FBI?
01:51:51 **A.** I don't recall specifically, but that is likely.
01:51:56 **Q.** Likely?
01:51:58 **A.** Yes.
01:51:58 **Q.** Was there a discussion about what you and Mr. Schwarz
01:52:02 would say or ask of Mr. Zheng?
01:52:05 **A.** I don't recall specifically.
01:52:07 **Q.** Okay. Special Agents Hull and Reigle weren't present,
01:52:13 though, were they? When you and Mr. Schwarz met with
01:52:16 Mr. Zheng?
01:52:17 **A.** When we were meeting, they were not in the room when we
01:52:20 were meeting with them.
01:52:21 **Q.** Were they present on GE property?
01:52:22 **A.** I don't recall if Special Agent Reigle was, but I
01:52:27 believe Special Agent Hull was.
01:52:35 **Q.** How was Mr. Zheng brought there? How did he come to meet
01:52:40 with you?
01:52:40 **A.** We were returning his asset, so we informed him to meet
01:52:43 us there so that way we could return his asset and then have
01:52:47 a discussion with him about our findings.
01:52:50 **Q.** What do you mean when you say "return his asset"?
01:52:52 **A.** To provide him his GE laptop. He was coming there to
01:52:56 meet us to receive that and to answer some questions that we

told him we wanted to ask him.

Q. Did he leave with his GE laptop?

A. He did not.

Q. So that was a ruse.

Did you hear me?

A. I did hear you. Was that a question?

MS. GLATFELTER: Objection, Your Honor. Argumentative.

THE COURT: Argumentative. Rephrase.

BY MR. KOHNEN:

Q. What did Mr. Zheng bring to the meeting that we're discussing?

A. He brought himself. I don't recall what else he brought.

Q. Okay. At the time you were meeting with him, was his workplace secured?

A. Could -- could you be more specific? The buildings are secured. Yes, we have badge readers and security guards at the buildings.

Q. Was his workplace, his physical workplace being searched?

A. I don't recall if that was happening at that specific time or not.

Q. Mr. -- Agents Hull and Reigle, from what I gather, were not in any way, shape, or form able to observe the meeting that you and Mr. Schwarz had with Mr. Zheng; is that correct?

01:54:14 **A.** I'm sorry. Could you repeat that again?

01:54:18 **Q.** I can do a better job, I hope.

01:54:21 When you and Mr. Schwarz interviewed Mr. Zheng --

01:54:28 **A.** Yes.

01:54:29 **Q.** -- to your knowledge at least, Agents Reigle and Hull were not in any way able to observe that, were they?

01:54:37 **A.** They were.

01:54:38 **Q.** They were?

01:54:39 **A.** Yes.

01:54:39 **Q.** Audio and video?

01:54:45 **A.** Audio and I believe video.

01:54:51 **Q.** Was that audio and video recorded?

01:54:56 **A.** I know the audio was. I don't know if the video was.

01:55:03 **Q.** Are you aware that GE Aviation was served with a subpoena for this kind of material?

01:55:11 MS. GLATFELTER: Objection, Your Honor. Sidebar, please.

01:55:13 THE COURT: I'll see the lawyers at sidebar.

01:55:15 (At sidebar.)

01:57:17 THE COURT: Ms. Glatfelter.

01:57:17 MS. GLATFELTER: I object to the form of the question, and I object to relevancy and misleading. Whether or not this witness was -- is aware of a grand jury subpoena or a subpoena or Rule 17 subpoena is irrelevant to this proceeding. He's referring to the Rule 17 subpoenas that the

Court indicated it was quashing and asking this -- he is going to ask this witness about that. Completely improper.

And the form of the question is are you aware, and it's suggesting a fact is also.

The cat's out of the bag, so I ask that the question be struck and the jury be instructed that that was an issue for the Court.

MR. KOHNEN: Judge, just because we didn't get the material doesn't make it irrelevant. It doesn't -- this was recorded. I'm learning this for the first time.

MS. GLATFELTER: We provided it in discovery and in *Jencks* materials.

MR. KOHNEN: The GE interviews were not provided.

THE COURT: I am not going to have this fight in the presence of the jury.

MR. KOHNEN: I'll move on.

THE COURT: It's for another time. I think the question is inappropriate and will be stricken, and Mr. Kohnen has indicated he'll move on.

(In open court.)

BY MR. KOHNEN:

Q. I'm going to try to get through this as quick as I can, Mr. Ridder.

So was -- did the prospect during the meeting between Mr. Zheng, you, and Mr. Schwarz, did the prospect of Mr. Zheng

hanging onto his job come up, do you recall?

A. I don't recall if that came up.

Q. And the FBI agents, Hull and Reigle, did they meet with Mr. Zheng after you and Mr. Schwarz did?

A. Yes, they did.

Q. Did they meet with him immediately afterwards?

A. Yes, they did.

Q. In the same room?

A. Yes, it was.

Q. Do you have any idea how long that interview lasted?

A. I do not recall.

Q. Did you review any audio or video of that interview?

A. I did not.

Q. Was it shared with the FBI?

A. I was not a part of reviewing any of that information.

MR. KOHNEN: If I may have a moment, Your Honor.

(Pause.)

MR. KOHNEN: Sorry to take so long, folks.

BY MR. KOHNEN:

Q. During your direct testimony, Ms. Glatfelter mentioned layers of an onion. Do you recall that?

A. I do, yes.

Q. And I'd confess, I was having a little bit of difficulty hearing, but -- and then it looked like there were a number of sort of layers that were kind of a euphemism for a description

of the different elements of security that you are responsible for. Does that make sense?

A. For the cyber security and IT security, yes, I am. For the physical security, I don't have direct responsibility for that.

Q. Okay. Fair enough. There was some of that testimony as well.

All right. So, yeah, she moved to physical security. It looks like you agreed that you had some responsibility for training employees, particularly when it comes to cyber data protection, and then you went on to talk about -- together about digital information.

THE COURT: You need to ask a question.

MR. KOHNEN: I'm sorry, yes. I am just trying to refresh the witness, Your Honor, and I have gone too far.

BY MR. KOHNEN:

Q. Your responsibilities include training to employees, don't they?

A. They do not.

Q. They do not.

Your responsibilities do include cyber data protection tools; is that right?

A. They do, that's correct.

Q. And, of course, the protection of digital information, right?

02:01:48 **A.** That is correct.

02:01:50 **Q.** One of the directories -- one of the first items in the directory that you and Ms. Glatfelter discussed -- I forgot to write the exhibit down -- but there was something entitled "Trench filler thickness measurements," and it referenced an engine called the GE9x. And Ms. Glatfelter asked you about that; is that right? Do you remember?

02:02:37 **A.** I do recall that, yes.

02:02:40 **Q.** Does the GE9x blade have a trench?

02:02:45 **A.** That is beyond my expertise.

02:02:53 MR. KOHNEN: May I have just a moment, Your Honor?

02:02:55 THE COURT: Yes.

02:02:56 (Pause.)

02:03:28 BY MR. KOHNEN:

02:03:31 **Q.** Let's finish with this, Mr. Ridder: Your first involvement in this matter began in July -- let's just call it mid July of 2017. Fair enough?

02:03:47 **A.** That sounds correct.

02:03:48 **Q.** On or about.

02:03:49 **A.** That sounds correct, yes.

02:03:50 **Q.** All right. And I may have neglected to ask this. How did Mr. Zheng first come to your attention? Was it a call from the FBI, or was it something that your internal security popped up?

02:04:02 **A.** It was a call from the FBI.

02:04:03 **Q.** Okay. And essentially you and the FBI worked together up
02:04:11 until -- through November 1st at least, right?
02:04:19 **A.** Through November 1st we had parallel investigations
02:04:23 going on related to Zheng.
02:04:27 **Q.** Okay. Did your investigation end on November 1st?
02:04:30 **A.** I don't recall the specific day that it ended.
02:04:34 **Q.** Do you recall how it ended?
02:04:36 **A.** We continued looking at the information, and once we
02:04:46 felt like we had a full grasp of the scenario, we ended the
02:04:50 investigation. I don't recall the specific date.
02:04:57 **Q.** I mean, you just ended the investigation? The FBI took
02:05:04 over, I guess; is that fair?
02:05:05 **A.** That is not correct.
02:05:06 **Q.** Okay.
02:05:07 **A.** The investigation into our employee, even after the
02:05:11 date of the interview, we continued to understand what
02:05:14 impact that may have had beyond that employee as well too
02:05:18 internally.
02:05:19 **Q.** Well, and that employee is scheduled to testify.
02:05:22 Were you consulted in any way, shape, or form by the FBI
02:05:25 or the U.S. Attorney's Office as to how that employee would be
02:05:28 treated?
02:05:29 **A.** I'm sorry. I don't -- could you repeat the question?
02:05:32 **Q.** Was GE Aviation consulted in any way, shape, or form by
02:05:36 the FBI or the United States Attorney's Office about how

Mr. Zheng should be treated?

A. That was beyond my scope of responsibility.

Q. Okay. And I made one -- one last mistake. It looks like your parallel work with the FBI didn't end in November of 2018. In fact --

MS. GLATFELTER: Objection, Your Honor. Form and argumentative.

THE COURT: Ask the question. Sustained.

BY MR. KOHNEN:

Q. Mr. Ridder, I apologize. I was wrong. Your cooperation/collaboration with the FBI continued until April of 2019, didn't it?

A. I'm not sure I understand the question completely.

Q. Have you ever heard of the Domestic Security Alliance Council?

A. I have.

Q. You and the FBI reported on this case to that austere group, did you not?

A. We presented at that and talked about some of the different things that happened in that case, that is correct.

Q. And how many people attended that presentation, do you know?

A. I do not recall.

Q. Can you ballpark it?

02:06:53 **A.** I honestly couldn't. I don't -- I don't recall how
02:06:58 many people were there.
02:06:58 **Q.** It was in April of 2019 in Arlington, Virginia. Does
02:07:02 that help at all?
02:07:04 **A.** Again, I don't recall the exact number of people that
02:07:08 were there.
02:07:09 **Q.** Okay. General Electric -- there was a slide deck that
02:07:13 was presented to the attendees, however many there were,
02:07:17 correct?
02:07:17 **A.** That's correct.
02:07:18 **Q.** And I think GE, General Electric, prepared four of the
02:07:23 slides. Does that sound familiar?
02:07:25 **A.** That does sound familiar.
02:07:27 **Q.** And I would assume, but you can tell me, the FBI prepared
02:07:29 the rest?
02:07:30 **A.** I believe so.
02:07:31 **Q.** Okay. It looks like, in the deck that we have, General
02:07:41 Electric prepared Slides 3 through 6. Does that sound about
02:07:50 right?
02:07:52 MS. GLATFELTER: Objection, Your Honor.
02:07:53 THE COURT: Sustained.
02:07:54 MS. GLATFELTER: That's not a question.
02:07:55 THE COURT: Sustained, sustained. Ask questions.
02:07:58 BY MR. KOHNEN:
02:07:58 **Q.** On these slides, each of the General Aviation-prepared

slides, at the bottom is a legend that says, "GE confidential." Are you aware of that? With the GE logo on the left?

A. I don't recall the contents of those slides, but that sounds plausible.

Q. And Slide 4, page 4, says --

THE COURT: If you are going to ask him about the slides, he needs his recollection refreshed.

MR. KOHNEN: May I approach, Your Honor?

THE COURT: Yes.

THE WITNESS: Yes, I've seen that marking before.

BY MR. KOHNEN:

Q. I just showed you what is Slide Number 4 of this deck, correct?

A. I'm not sure what slide it is, but I did see the slide that you shared with me, yes.

Q. And on the bottom to the left of that page is the GE logo and then the words "GE confidential - for internal use only," right?

A. I did see that marking on there, that's correct.

Q. Okay. And this is a slide that was shown to a group of people at the Domestic Security Alliance Council; is that correct?

A. That sounds correct.

MR. KOHNEN: Thank you very much, Mr. Ridder.

02:09:40 THE COURT: Redirect, if any.

02:09:41 MS. GLATFELTER: None from the government. Thank you, Your Honor.

02:09:44

02:09:45 THE COURT: You can step down, sir. Your testimony is complete. You are welcome to leave.

02:09:47

02:09:52 THE WITNESS: Thank you.

02:10:04 THE COURT: Where do we stand from the government's perspective?

02:10:06

02:10:08 MS. GLATFELTER: We have another witness to call. Perhaps this would be a good place to break and then come back and start the witness.

02:10:10

02:10:14

02:10:15 THE COURT: Very well. We'll take a 20-minute break till 2:30.

02:10:18

02:10:19 During the break, take the break. No discussion of the case among yourselves or with anyone else. No independent research. Continue to keep an open mind.

02:10:22

02:10:25

02:10:27 Out of respect for you, we'll rise as you leave.

02:10:30 THE COURTROOM DEPUTY: All rise for the jury.

02:10:33 (Jury out at 2:10 p.m.)

02:11:08 THE COURT: The jury's left the room. We are in recess for 20 minutes.

02:11:10

02:11:13 THE COURTROOM DEPUTY: The court is now in recess.

02:11:16 (Recess from 2:11 p.m. until 2:29 p.m.)

02:30:04 THE COURT: Are we ready to get the jury from the government's perspective?

02:30:07

02:30:08 MS. GLATFELTER: Yes, Your Honor. Thank you.

02:30:09 THE COURT: And the defense?

02:30:18 MR. McBRIDE: Yes, Your Honor.

02:30:19 THE COURT: Very well. Let's get the jury.

02:31:35 THE COURTROOM DEPUTY: All rise for the jury.

02:31:37 (Jury in at 2:31 p.m.)

02:32:07 THE COURT: You may all be seated. Thank you.

02:32:13 The 15 jurors have rejoined us after break. Thank you for your continuing attention and continuing work.

02:32:21 The government's going to call another witness at this time. Who does the government call, Ms. Glatfelter?

02:32:26 MS. GLATFELTER: Thank you, Your Honor. We call Nick Kray to the stand.

02:32:29 THE COURT: If that gentleman would be willing to approach. I am going to put you up on the witness stand. And if you'd be willing to pause where you are, I am going to ask you to take the oath to tell the truth.

02:32:44 Our right hands are raised. Do you solemnly swear or affirm that your testimony today will be the truth, subject to the penalty of perjury?

02:32:51 THE WITNESS: I do.

02:32:52 **NICHOLAS KRAY, PLAINTIFF WITNESS, SWORN**

02:32:52 THE COURT: Very well. Climb up and get you acclimated.

02:33:00 THE WITNESS: Is it okay to take this off

(indicating)?

THE COURT: If you wish to take your mask off, you may.

THE WITNESS: Thank you.

THE COURT: We'll need you up close to that fancy federal microphone. Exhibits may come up on the screen or in paper in front of you.

The attorney for the government has a chance to begin with questions of you.

Ms. Glatfelter.

MS. GLATFELTER: Thank you, Your Honor.

DIRECT EXAMINATION

BY MS. GLATFELTER:

Q. Mr. Kray, can you state and spell your name for the record?

A. Yes. Nicholas Kray. N-I-C-K K-R-A-Y.

Q. And, Mr. Kray, are you currently employed?

A. Yes.

Q. Where?

A. General Electric Aircraft Engines.

Q. What does -- does it also go by GE Aviation?

A. Yes.

Q. And what does GE Aviation do?

A. We, well, design and manufacture commercial and military aircraft engines.

02:33:52 **Q.** Who does GE Aviation sell its engines to?

02:33:56 **A.** So we're a global company. We sell engines basically to any airline globally across the -- across the world.

02:34:07 **Q.** How long have you worked for GE Aviation?

02:34:09 **A.** Over 33 years.

02:34:13 **Q.** And what's your current position there?

02:34:15 **A.** I'm a chief consulting engineer for polymeric composites.

02:34:22 **Q.** I'm sorry. You said for what?

02:34:24 **A.** Polymeric composites.

02:34:27 **Q.** Polymeric composites?

02:34:31 **A.** Yes.

02:34:31 **Q.** Can you explain what you do, like, every day for your position? What a day in the life of Nick Kray is?

02:34:39 **A.** Okay. So I work in the chief engineer's office, and it's -- the chief engineer's office is essentially an independent engineering division within aviation. We have kind of three main goals. First one is safety. I mean, in aviation safety is obviously number one for everything that we work on.

02:35:00 Number two is to make sure that all of our designs are evaluated with design rigor to make sure that when we release either a new product to the field or we fix a field product that's existing, we do as much rigor as possible to make sure that that's a good fix or good product.

02:35:26 And number three is to actually mentor our younger
02:35:29 engineers in a technical track to make sure we build a
02:35:35 strong technical base for our next generation of engineers.
02:35:37 **Q.** And you said that you work in the area of polymeric
02:35:42 composites? Did I pronounce that right?
02:35:43 **A.** Yes.
02:35:43 **Q.** I want to come back in that area in a moment, but I want
02:35:46 to understand more what a chief consultant engineer does. Can
02:35:50 you describe that to the jury?
02:35:51 **A.** Sure. So I get involved in all different type of
02:35:55 issues at Aviation, whether it's a new product introduction,
02:35:57 a new design, so to speak. We typically have to make sure
02:36:01 the design rigor and the way we approach the design is
02:36:05 adequate, that we result in a safe design; or if we have a
02:36:09 field problem, to make sure that we pull the right team
02:36:12 together to work on that field problem to make sure we
02:36:15 address it and fix it for our customers.
02:36:18 **Q.** How long have you been the chief consultant engineer?
02:36:22 **A.** It's been a little bit over a year now.
02:36:24 **Q.** And what did you do before that at GE Aviation?
02:36:28 **A.** Before that, I was in other technical positions of
02:36:33 consulting engineer and principal engineer, again in
02:36:37 polymeric composites. I worked on MPI design and sustaining
02:36:42 programs to support both of those.
02:36:44 **Q.** And your area of focus has been polymeric composites

through those different positions?

A. Polymeric composites has been my expertise for probably 25 years now.

Q. What kind of training and experience has prepared you for your current position.

A. So certainly -- certainly school, you know, the baseline college education. I have a master's and a Bachelor's of Science in mechanical engineering, both in the University of Cincinnati.

We have in-house training. General Electric offers their employees a very rigorous training program. It's on a selected basis. You can take these courses at your -- at your leisure. And then obviously trying to keep our transfer of knowledge between senior engineers and younger engineers, you always work within a team to make sure that you, again, gain the knowledge from the more senior people and kind of build upon that.

Q. Thank you. So you said you have a bachelor's degree?

A. Correct.

Q. And what is that in?

A. Mechanical engineering.

Q. And where did you get that from?

A. From the University of Cincinnati.

Q. Thank you. During your career at GE Aviation, you said you focused on polymeric composites for how many years?

02:38:04 **A.** About 25.

02:38:05 **Q.** Can you explain to the jury what a composite is? When you use that term, what you mean?

02:38:14 **A.** Okay. So composite is a very broad term. Think about it as taking two different materials and mixing them together, but when the resulting product of those materials is still separate.

02:38:23 So -- so an easiest way to say, for example, when you put a cast on your arm. You mix fibers with a plaster of paris. You mix it up and you wrap it on your broken arm or leg, and that cures, and it cures as a hard substance. That essentially is a composite in a very broad sense.

02:38:45 THE COURT: Can I interrupt and ask you to bring the microphone closer?

02:38:49 THE WITNESS: Sure.

02:38:50 BY MS. GLATFELTER:

02:38:50 **Q.** So you were using the analogy of a cast?

02:38:52 **A.** Correct.

02:38:53 **Q.** Okay. I just want to make sure everyone could hear you. If you could repeat that last answer for us. You were trying to give us an analogy of what a composite is. If you could repeat that while you are closer to the microphone so everyone can hear you.

02:39:07 **A.** Yeah, sure. So composite is a substance that is typically fibrous and a binder material. So as a cast, you

typically put a fibrous, a cloth material, you dip it in plaster of paris, wrap it on your arm or a leg, and then it cures or hardens, and the resulting structure is essentially a composite.

Q. Now, is there a particular area that you have been involved in during your career, a certain application of those composites at GE Aviation?

A. Yes. My main involvement over the last 25 years has been on composite fan blades and fan cases.

Q. What's the function of a fan blade and a fan encasement?

A. So a blade -- a blade in a triple fan engine essentially pumps the air. That's the whole purpose of it. And pumping of the air gives the aircraft thrust. So it's to pump the air.

The containment case is to make sure that if we -- if the blade releases inadvertently from the retaining structure, it is still contained, does not hit the fuselage of the aircraft.

MS. GLATFELTER: Okay. And if we can show the jury and the witness Exhibit 78, which is already admitted into evidence?

THE COURT: Yes, we can publish it.

MS. GLATFELTER: Thank you.

THE COURT: So could you move your binder to your left, sir. Way over. Now, will you pull the microphone in

front of your mouth and speak to the jury and turn your head. It's hard.

THE WITNESS: Okay.

THE COURT: You're doing fine.

Go ahead. Sorry.

MS. GLATFELTER: Thank you, Your Honor.

BY MS. GLATFELTER:

Q. All right. Does this graphically or illustrate the concepts you were mentioning before about the propulsion of the fan blades and the function of the fan blades and encasement?

A. Okay. You want me to go through this --

Q. Yes.

A. -- figure here.

Q. Will this help you explain?

A. Yes, certainly it will help. I think it will help the jury understand as well.

Q. And I think if you touch your screen, I think we can -- you can point to different parts as you're speaking. There you go.

A. Okay. So to give a little bit of Jet Engine 101 so everybody can understand it.

So when you look at an aircraft, you obviously have the aircraft, but the engines are what typically sit underneath the wing. And typically they look like a couple big tubes,

right? I mean, all you see are the white tube coverings on that jet engine.

If you took that cell covering off, you would see a structure that's similar to this, all right? This is the carcass of a jet engine. It's a cut-away view, so you can see some of the internals in a jet engine.

The jet engine's made up of a couple of different modules here. The fan module, which is this guy right here (indicating), is the main pumping for air. And the big purpose for that is to get as much air through the -- through the engine as possible. As it pumps air, it pushes the aircraft forward.

The thing that makes the aircraft fly is forward velocity from the engine. The wings make it lift. And that's how you get flight. Okay? So the engine's doing all the pushing.

So the fan module is up here (indicating). Then you have a compressor module here (indicating) which compresses more air, so the air kind of comes into the engine. We compress it very, very tightly, okay. Pressure ratio gets very compact. Right here (indicating) we add fuel into that compressed air. The fuel lights off, expands the air even more, and it comes out the back of the engine, okay.

Now, a couple things happen. When it expands, it goes through the turbine blades here (indicating). The turbine

02:43:13 blades are hooked to the compressor blades so they spin at
02:43:17 the same time. So I'm feeding energy to continue my
02:43:20 pumping. So I add fuel and I pump it, and I continue to
02:43:24 pump fuel, and then as it exits the aircraft it goes through
02:43:31 the pumper feed back here (indicating). And it drives the
02:43:34 fan blades and pumps the majority of the air to get the
02:43:38 thrust to the engine. That whole system basically makes as
02:43:41 much forward thrust on the aircraft as possible.
02:43:43 **Q.** Mr. Kray, we also -- or you mentioned before the fan
02:43:46 encasement system?
02:43:47 **A.** Um-hmm.
02:43:48 **Q.** Do you see that on this illustration?
02:43:50 **A.** Yes.
02:43:51 **Q.** Okay.
02:43:51 **A.** The containment system is here (indicating), cross-
02:43:54 section view. It goes all the way around the fan blades.
02:44:00 The cut-away view, you can't obviously see all of it, but it
02:44:04 encompasses the fan blades.
02:44:06 **Q.** All right. And what are -- if the fans help propel and
02:44:08 push the air to the compressor, what's the function of the
02:44:10 encasement system?
02:44:11 **A.** So one of the -- one of the requirements from the
02:44:18 Federal Aviation Administration for safety, again, is to
02:44:22 design a system such that if one of these blades breaks,
02:44:27 okay, and releases from the spinning, this holds it. It has

to be contained within this containment structure so it doesn't hit the aircraft and obviously damage passengers.

It doesn't happen that often. Fan blade releases do very seldom happen. We have had a case -- and it's been in the newspaper just, I guess it was in February, of one of our competitors that lost a fan blade, did a lot of damage. The inlet ended up on the ground and in somebody's front yard in Texas.

So it does happen. We have to design to make it as safe as possible.

Q. And in order to have an engine certified, do you have to test the capability of your fan encasement?

A. Yes. The Federal Aviation Administration requires a full engine blade-out test for certification. We have to take a complete engine, intentionally release a fan blade, and show containment in a safely -- a safe shutdown of that engine if that indeed happens.

Q. Now, have you been involved in the development of GE's fan blade and containment system over the course of your career?

A. Yes.

Q. And in what roles?

A. So my first encounter with composites, polymeric composites, was on the GE90-115B fan blade design. I was on the design team for that. And that's -- our GE90 engine

goes on the 777 aircraft. That was a new product introduction. It was a brand new design. I saw that through design and certification, which included the testing, including fan blade-out.

Then I was a team lead for our GEnx engine family. At GEnx, we have a 1B GEnx engine, which goes on a 787 aircraft; and we have a GEnx-2B family, very similar, which goes on the 747-800 aircraft.

And then just recently, as a consulting engineer or chief consulting engineer, of involvement on our GE9x engine, which is our latest offering on a 777X, which is yet to be certified by Boeing. So it's a certified engine but not a certified aircraft yet.

Q. And what part of the engine have you worked on?

A. Typically the blades and the casement the majority of the time. Obviously, we have other composite sundry parts in the engine, but the majority of it has been the cases and the blades.

Q. And have you been involved in the design process for using a composite material for GE fan blades?

A. Yes.

Q. And GE containment systems?

A. Yes.

Q. Okay. When did GE start using composite material for its fan blades?

02:47:25 **A.** Our first fan blade design was started probably 1989, maybe early '90. And that was -- it was certainly developed before that as far as a subcomponent testing, et cetera, but the final product was certified in 1995 on our GE94B, which was the first engine that we put on a 777 before the 115B.

02:47:57 **Q.** And that engine had composite fan blades?

02:47:59 **A.** Correct.

02:47:59 **Q.** Does GE Aviation have particular expertise in this area, composite fan blades?

02:48:06 **A.** I think we're probably the world leader in composite fan blades. Actually, nobody else has composite fan blades certified in production other than General Electric.

02:48:21 **Q.** Is GE Aviation the only company in the world that has the combination of the composite fan blade and containment system?

02:48:28 **A.** That is correct.

02:48:30 **Q.** Does GE derive a competitive advantage from using the composite fan blade with the composite encasement system?

02:48:39 **A.** Certainly. It is one of our, I would say, biggest advantages in the commercial airspace, is that combination.

02:48:48 **Q.** Why -- what is unique about being able to use a composite material in a fan blade? How is that advantageous?

02:48:56 **A.** Okay, so to give a little bit of background. So typically aircraft engines up until our introduction of composites had metal blades. And the material of choice has typically been titanium. That's been the industry standard

02:49:11 ever since, you know, the 1940s.

02:49:14 The problem with that is these engines run at very high
02:49:20 RPM. It spins very fast. And imagine yourself pulled in
02:49:25 onto a rock on a rope and spinning it around, okay. And you
02:49:28 got to hold onto that rope pretty, pretty hard, right? If I
02:49:33 put a bigger rock on that rope, it's going to get even
02:49:36 harder to -- you spin at the same RPM, it's going to get
02:49:40 even harder to hold; am I right?

02:49:40 When you get to the size of these engines, which are
02:49:44 very large -- our GEnx9 -- our GE9X is, you know, 13 feet in
02:49:51 diameter. So the blades are very, very large. To hold onto
02:49:56 those would be almost impossible -- well, it would be
02:49:58 impossible if they were metallic. So we have to look at
02:50:01 lighter alternatives.

02:50:02 Composite material is about a third of the density of
02:50:06 titanium. All right. So I'd certainly have an advantage if
02:50:08 I can make it a lighter blade, still pump the air and get
02:50:12 the same performance, and yet be able to hold onto that
02:50:15 blade as it spins very fast.

02:50:17 Now, our competitors have gone to hollow titanium as an
02:50:22 alternate. All right. Hollow titanium has a lot of
02:50:26 disadvantages in that it has a lot of stress risers internal
02:50:30 to the blade because it's got hollow cavities. And when you
02:50:34 machine out something with very tight radiuses, you get very
02:50:38 high stress concentrations.

Our composite blades don't have that. They are monolithic. They are 100 percent composite through. And they are, again, a third of the density. So we have that advantage, from a design perspective.

Q. Let me ask you a few questions about that. So you mentioned stress risers?

A. Yes.

Q. Do I have that term right? What did you mean by that?

A. So I guess I'll go back to the recent example I talked about earlier. One of our competitors had a fan blade failure in February. I think it was February of this year. That resulted from stress concentration internal in the blade because it was a hollow metallic blade.

The stress concentrations basically have a high stress in a certain area of the blade. And as that stress either works itself from an LCF perspective -- you know, think about a paper clip. I bend a paper clip back and forth, back and forth, eventually, it's going to break.

So what happens is when you have a stress concentration, as I cycle that blade, on every flight it takes off, it takes -- comes down. Every flight it gets more and more cycles. Eventually, if I have a stress concentration it will start to propagate a crack in that local area, which can then lead to a blade separation.

Q. So when you talk about greater durability, that's what

you're talking to in terms of the composite fan blades?

A. Yes. Composites inherently have much better durability than metallics. On a back-to-back basis, the fatigue capability of composites is superior to any -- any metallics.

Q. You mentioned before that they are lighter than hollow titanium or metallics. What is the benefit of having a weight reduction for your engines?

A. So, again, you know, we build engines for our customers. Our customers want a light -- as weight-efficient design as possible. And we try to provide that. Certainly safety first, but then give it a light design.

The more I can take weight out of the engine -- because every time the aircraft takes off, that weight goes with the engine, right? I lift it up each time. The lighter I can make it means I can either put more passengers on the aircraft or I can put more seats in the aircraft; I can either go the same amount of seats, I can go farther distance. I can fly from, you know, let's say the United States to India, for example, versus having to stop in Europe. So I can go farther if I have a lighter design.

Q. Thank you, Mr. Kray. You've been working on this technology for a long time. How long has it taken GE Aviation to develop the composite fan blade technology?

I'm sorry. Go ahead and take a drink, please.

02:53:29 **A.** A typical NPI introduction of a new material, like
02:53:34 composites -- and I'll go by our experience -- it took
02:53:38 between 10 to 15 years to develop the composite fan blade
02:53:43 for the GE -- first GE9 engine.
02:53:47 **Q.** And so how long is a cycle now? When you are developing
02:53:52 a new engine, based on your experience that you've gained from
02:53:57 these prior engines, how long is it taking?
02:53:59 **A.** I would say we've taken it down from 10 to 15 years to
02:54:03 probably 6 to 10 years. Again, it's a learning curve,
02:54:10 right. So as you learn things from previous designs -- what
02:54:13 works, what doesn't work, design know-how, so to speak --
02:54:17 you can shorten that design cycle.
02:54:19 And certainly that's one of our goals, right, is to
02:54:21 make it as short as possible so we can get a product to our
02:54:24 customers faster, and a more reliable product.
02:54:28 **Q.** And you mentioned some specific models of GE engines over
02:54:33 time that use the composite blade technology. Can you go
02:54:36 through that list again?
02:54:36 **A.** Sure. So the first, first one was certified was the
02:54:40 GE94B. All right. And that was on the 777, the first 777
02:54:46 aircraft that was launched by Boeing. And that was in circa
02:54:50 1995-ish.
02:54:53 Okay. The next one after that was the GE90-115B, which
02:54:57 goes on the 777, extended ER. They call it the extended
02:55:05 range 777 which is basically a bigger 777.

And then the GEnx-1B -- which I believe this picture's a GEnx-1B -- that goes on the 787 aircraft. I believe that was certified in -- I think in 2005-ish. Don't quote me on that, but it's around 2005.

And then the GEnx-1 -- 2B followed very closely thereafter because we had a request from Boeing to the aging 747s. So we basically leveraged this GEnx-1B design to a GEnx-2B, a little bit different thrust, different air pumping to match that airframe. That was certified a year or two after the 1B.

And then just recently the 9X, which is our latest offering, which is, again, a 13-foot diameter engine, which is going to go on the 777X, which again is an even bigger variant than the 777 from Boeing. But it, again, is not certified yet, with Boeing, but the engine hasn't had all the certification.

Q. Now, Mr. Kray, you mentioned several models of GE engines. Are you familiar with the LEAP engines?

A. The LEAPs?

Q. Yes.

A. Yes, I am.

Q. What is that?

A. The LEAP engine is an engine from our CFM, CFM-I. It's a partnership between GE and our revenue-sharing partner Safran, from France.

02:56:34 **Q.** Okay. And what kind of -- what kind of aircraft is the
02:56:37 LEAP engine?
02:56:40 **A.** So the LEAP goes on -- there is basically three main
02:56:43 aircraft that the LEAP goes on. It goes on the 737 Max
02:56:48 aircraft. This is the one that was recently grounded,
02:56:51 right, for all the other issues. It wasn't the engine. But
02:56:53 the 737 Max. The 8320, it goes on that; and the COMAC,
02:57:03 C919, I think it is.
02:57:06 **Q.** And the LEAP engine, does it have composite fan blades?
02:57:10 **A.** Yes, it does.
02:57:16 **Q.** Have you been involved in the -- in that project?
02:57:21 **A.** Yes. So the fan blade is actually owned by our
02:57:24 revenue-sharing partner, Safran, from France. However, we
02:57:28 were very instrumental in assisting them in getting them
02:57:31 that product certified, leveraging our learnings off of our
02:57:36 composite fan blades.
02:57:37 **Q.** And so what does GE bring to the table in that
02:57:41 partnership?
02:57:41 **A.** So certainly our expertise in design; our, obviously,
02:57:46 design understanding, the material property understanding;
02:57:50 our testing methods, which are sometimes unique for
02:57:52 composite blades versus a metallic blade; and then our
02:57:57 certification approach, which is somewhat unique sometimes
02:58:01 with composite versus metallic blades. And all that
02:58:05 interaction with how to approach the FAA on the best way to

02:58:08 satisfy their requirements for safety of that engine.
02:58:14 **Q.** Okay. And what does Safran bring to the table with that
02:58:17 particular engine?
02:58:18 **A.** So certainly Safran is -- again, they are also an
02:58:21 engine company in France. They make more engines than just
02:58:24 the CFM, our LEAPs. They make other military and commercial
02:58:29 engines. So certainly they have expertise in aerodynamics
02:58:34 and just like GE would. They have their own suite of
02:58:37 engineering with respect to engine development.
02:58:40 **Q.** So both companies bring their own expertise --
02:58:42 **A.** Yes.
02:58:43 **Q.** -- to --
02:58:44 **A.** It's typically what we call our revenue-sharing
02:58:48 partnership, where we both come to the table equally, both
02:58:51 from a business perspective, from a monetary perspective,
02:58:57 but from a knowledge base to come up with a very viable
02:59:00 product.
02:59:00 **Q.** Okay.
02:59:00 **A.** CFM has been -- has been a good partnership since like
02:59:04 1980s with GE and Safran and has been very, very -- very,
02:59:10 very positive for both companies. We sell a lot of engines.
02:59:15 I think all 737s -- well, not all -- I would say the
02:59:19 majority of them have either CFM or Flash LEAP engines,
02:59:25 which are under the same partnership.
02:59:26 **Q.** Now, you said that GE and Safran have been in sort of a

business relationship for back -- back until the '90s or '80s, did you say?

A. Probably since the '80s, I believe.

Q. Okay. And do they have a composite fan blade apart from the LEAP engine?

A. No. LEAP is the only composite fan blade they have.

Q. Okay. And so even though you've been working in this joint venture, they haven't been able to develop their own composite fan blade engine?

A. Well, it's kind of a shared -- it's a little bit of both. Typically, we'd keep our, we keep all of our IP, our intellectual property, separate, whether it's CFM-I or GE or Safran, right. So there's -- there's a very fine line of sharing technology and making an engine versus sharing technology for the sake of sharing technology.

Q. All right. So for an example, does Safran have access to GE Aviation design files about the composite fan blades used on the GE9x?

A. No, they would not.

Q. Do you -- strike that. Because you have this partnership -- because GE Aviation has this partnership with Safran on the LEAP engine, do they have access to other non-public information by GE, other things besides the LEAP engine?

A. I would say nonpublic, probably yes. I mean, there are

a lot of things that we have to share to make an engine work, you know, whether it's interfaces at critical joints. We have to give loads that they can then design their hardware with.

So, yeah, I would say they do have some non-public information, certainly.

Q. Okay. But they don't have like the design files and the testing files and all of the --

A. No.

Q. -- files you built up over the last 20 to 30 --

A. No.

Q. -- years?

A. Not at all.

Q. Has developing these composite fan blades and containment systems been expensive for GE Aviation?

A. Yeah. So let's talk about that a little bit. So as I said, if it's a new product, it takes about 10 years to develop a product.

And you think about it's kind of built like a learning pyramid, okay? The very bottom is, is you start with the material system composite, for example. And you do coupon testing. You very simple coupon test, and you start to characterize the material itself, you know: How strong is it? When does it break? How does it break? How many times can I bend back and forth, this paper clip, before it starts

to fatigue? That's a very basic coupon level.

Then I go up to a subcomponent level. I start to look at different features, you know: Can I drill a hole in it? Can I bond metal onto it? You know, how do I protect it from sunlight, ultraviolet lightings, that type of thing.

Then I get into component testing. I make a blade. I can test that blade very -- you know, by itself. I can test it either -- and I can shake it, you know, to put vibration into it. I can throw birds at it. I can -- I can pull it until it breaks. That's at the component level.

And then certainly as I start getting to, you know, system-level evaluations, I look at disks and spinning it and containment cases and how does it fracture, how does it release. And then at the end, obviously, you have a top-level engine test.

So typically that, that type pyramid, to develop that type of pyramid is hundreds of millions of dollars. Astronomical. I mean, a single-engine test for this type of test, just to do a fan blade-out test, which is a very high level on this pyramid, is probably $15 million. Because the engine alone at the development stage is probably at least $10 million. And when I do a fan blade-out test, I essentially destroy that engine.

So that's the one test, and I have got a whole gamut of tests I have to do to understand the material and certify

the material. So it's very, very expensive.

Q. How much did you say that one test is?

A. This test is probably at least $15 million. At least.

Q. Per test?

A. For one, for one engine test. Now, I talk about subcomponent tests, you know, a single-blade test. Let's back it down even -- down the pyramid even further, all right?

A single-blade test, if I want to, for example, shoot a bird at it, which is -- we can talk about that more -- but I can shoot a bird at it, and that single test is about a quarter million dollars, about $250,000.

So -- and I don't just do one test, right. I have to do a whole gamut of tests to understand what's my threshold. You know, is this spot in the blade critical? Is this spot critical? Is the back? Is the front? So that's -- you know, you could see how it adds up very quickly.

Q. So I want to ask you about a few things you mentioned there. I will ask about the bird test, but I want to get back. I want to ask the other ones first.

You mentioned a fan blade-out test. Is that what you are referring to as testing the engine to failure?

A. Yes.

Q. Can you please describe that more to the jury?

A. Sure. So can I erase this screen some how?

THE COURT: We can erase it.

THE WITNESS: Perfect. So imagine this is a development engine here, all right? And I have to release the blade there (indicating). That's a requirement from the FAA to say, you have to demonstrate -- GE, you have to demonstrate that if a fan blade fails there, that -- a couple things. Number one, it's contained, right? It doesn't come out of the encasement, hit the aircraft, and go into the passengers, number one.

Number two, the engine doesn't fall off of this mount switch up here and this mount here (indicating). The loads, the unbalance of the engine, if I release this big, heavy blade, right, that spins at, you know, 3,000 RPM, as soon as I lose one of those, there is a big imbalance in the engine and it shakes violently. If you ever see one of these tests, I mean, it shakes.

So all of the loads going into these structures here are very, very high. We design for them, but you have to prove that our design works. So we test for it. So that's the second thing.

And the third thing is anything back in here (indicating) can't start on fire. You can't have a fire in the aircraft because -- or on the engine, right. So even if it holds on the wing, if it's on fire, you know, and you are sitting in the seat and you are looking out the window and see a fire,

you're not going to be very happy. So we have to make sure there's not a fire.

So those three things, basically, that test damages, completely damages the engine. It's no longer usable for any other test. So that's -- again, a development engine, on this size, is at least $15 million. At least.

BY MS. GLATFELTER:

Q. So when you say fan blade-out or test to failure, you mean you have to actually make that engine show how it works --

A. Yes.

Q. -- when it fails?

A. Yes. You have to actually -- what we do on this line down here, this guy down here (indicating), we intentionally put explosives in there and we release it. Spin the engine up to top speed, hit the explosives, it cuts the blade. The blade releases. Has to be shown that it's contained in this structure, right. And then all the subsequent loads and the lack of fire have to be demonstrated.

Q. Okay. I'm sure the jury's interested in this because you mentioned a bird test. So before we move on, could you just tell us what you meant by a bird test?

A. Sure. So aircraft, you know, when we fly in the air, right, one of the biggest threats for the fan module is, this front end of the engine, is birds. It happens a lot.

03:07:40 Bird strikes happen on aircraft all the time.

03:07:43 In the Hudson River, right, took a bunch of birds to

03:07:46 make the engine stop.

03:07:47 So we have to design for bird strike. And one of the

03:07:51 things about bird strike is obviously this front profile,

03:07:55 the engine, is the first thing the bird's going to hit. So

03:07:58 the blades, we have to make sure the blades don't get

03:08:01 damaged beyond what -- there is various criteria. The FAA

03:08:07 has, based on engine size, criteria for small birds up to

03:08:13 two and a half pounds, medium birds up to five and a half

03:08:18 pounds, and then very large birds up to eight pounds, a

03:08:21 Canadian geese type of bird. You have to show --

03:08:23 demonstrate for each one of those bird sizes that your

03:08:26 engine, again, is safe; whether it's going to keep producing

03:08:30 thrust for small birds -- in other words, if I take off and

03:08:32 I take a bird or two, I'll make sure I can keep pushing

03:08:37 thrust, right, so I can either turn around to the airport

03:08:40 and re-land and I don't have issue; or if it's a very large

03:08:44 bird, again, if it breaks a blade off somewhere, that

03:08:48 safe -- that engine is still -- contains the piece of blade

03:08:52 that's broken off and have safe shutdown. So I can still

03:08:57 operate on one engine if I have to and still make a safe

03:09:00 return to the airport.

03:09:01 So, yeah, birds -- and we have to demonstrate that we

03:09:05 have to actually fire birds into an engine to show that that

is indeed compliant with those requirements.

Q. That's an FAA requirement?

A. It is an FAA requirement. But, again, just like -- just like FBO -- we talked about FBO and the cost of doing that -- you know, we don't -- from a business perspective, we don't wait until last minute to do those type of tests.

There's a lot of engineering tests that are done before we do our certification test, right. So we do a lot of ingestion on an engineering basis, shoot birds into the fan to make sure that we're comfortable from a design perspective that that design is adequate.

And then, certainly, the last test or the certification test is witnessed by the FAA, and that is basically the -- you get a checkmark there and say, yeah, you passed that test.

But, typically, these big tests, these big, expensive tests, we don't -- we don't just do one test at the end. We do a series of engineering tests to lead up to that successful demonstration. We don't want to do it for the first time in front of the FAA, because you don't want to show the regulatory agencies that, you know, you are very cavalier. It's not a proper design approach.

Q. Mr. Kray, has the cumulative knowledge gained during the testing and analysis process over these cycles been important to GE Aviation in developing its fan blades and containment

system technology?

A. Well, certainly. And I think the perfect example of that is, as I said, the first composite blade, you know, took probably 15 years to certify. Now that we're up that learning curve, we are down to probably seven, just half that. Or maybe a little bit less than that.

So we can leverage off of our current learnings that we document our design practices into our design study summaries that, again, a new engineer can go in, access those studies, and learn what worked and what didn't work so you don't have to reinvent the wheel each time you come up with a new design.

Q. The results of these composite fan blade testing, it builds on one another, from cycle to cycle?

A. Yes, as much as we can certainly. Certainly, every engine has its own thrust requirements. So the 9X has a thrush requirement, let's say, of 115,000 pounds of thrust. Where the GEnx might be 70,000 pounds of thrust. So certainly the size of the engine, the RPM, is different for every application to optimally match the engine to the airframe. But certainly, the basic understanding of leverage of that learning curve, yes.

In our design reviews, we typically pull up previous designs, how we benchmark against those designs, and say, yeah, you're within that learning curve. If you're not or

03:12:09 if you want to deviate from that learning curve, there is
03:12:13 certainly a lot more rigor that we would then put on that
03:12:16 design to make sure that, again, we have, number one,
03:12:18 safety, right, a safe product, first of all. And then,
03:12:21 second of all, is it feasible to do that or should you back
03:12:24 off your design maybe and get it maybe a little more
03:12:27 conservative.
03:12:28 **Q.** And those design files that you were just mentioning,
03:12:31 does GE share their design files with its competitors?
03:12:34 **A.** No, not at all.
03:12:38 **Q.** And during these cycles, does GE develop information
03:12:42 about the composite fan blades and containment system that it
03:12:46 tries to keep secret?
03:12:47 **A.** Yes. A composite fan blade and containment system is
03:12:53 what we call our key technology. So it's an internal --
03:12:57 internal specification that we at GE Aviation put on. It's
03:13:01 one of our -- we consider it our competitive advantage
03:13:07 technologies. It is deemed a key technology, which we have
03:13:12 a key technology board, which is run by chief engineer's
03:13:17 office. And it looks at general technologies across the
03:13:22 engine -- certainly composite blades and cases is one of
03:13:24 those -- and deems, if it is considered key technology, it
03:13:30 puts an additional level of, I am going to call it, security
03:13:32 on that information such that it doesn't get disseminated.
03:13:37 **Q.** And would public information -- I'm sorry -- would public

03:13:40 disclosure of this information about composite fan blades and
03:13:44 composite containment systems that we just talked about, would
03:13:47 that disclosure be economically harmful to GE Aviation?
03:13:53 **A.** Certainly, certainly. First of all, it's our
03:13:55 composite -- it's our competitive advantage, right. So we
03:13:59 know the competitors are trying to get composite fan blades.
03:14:03 We know Rolls-Royce, for example, has tried this a couple of
03:14:07 times. And I go back to probably 1980 was the first attempt
03:14:12 that Rolls-Royce did it. The second attempt was maybe five
03:14:16 or ten years afterward. And it almost bankrupt the company
03:14:19 because they had put a couple programs mainstream that they
03:14:24 were going to use composite blades, and they couldn't make
03:14:26 it work. So it was very difficult for them.
03:14:30 So certainly, it is our competitive advantage. It's
03:14:33 one of the things our customers like about the GE engines,
03:14:36 because, again, its durability. You know, its resistance to
03:14:40 fatigue. It doesn't come with all the stress risers that
03:14:45 have metal blades. It's something that our customers, the
03:14:48 airlines, love, is the composite blade.
03:14:53 MS. GLATFELTER: All right. I would like to show
03:14:57 the witness what's been admitted as Exhibit 69 and publish
03:15:01 this to the jury?
03:15:02 THE COURT: Yes, show everybody 69.
03:15:10 MS. GLATFELTER: Ms. Prim, if we'd pull up the last
03:15:12 page of that exhibit. And if you can enlarge it just a little

bit.

BY MS. GLATFELTER:

Q. Now, Mr. Kray, have you seen this document before?

A. Yeah.

Q. Have you seen this before your testimony today?

A. Yes.

Q. Okay. And you've had an opportunity to read it?

A. Yes.

Q. Are there terms on this page that relate to either jet engine composite fan blade or composite fan encasement?

A. Certainly. So I hope my pointer will work again. I've got fan rotor blades made of composite materials, okay. That certainly points to GE Aviation. We're the only ones with it, right.

Prepreg. Let's talk a little bit about prepreg. Prepreg is composite material. Composite material comes in a couple different forms. Again, it's a fiber and a resin. A prepreg is a combination of those that are basically like a sheet of paper. It's got fibers and it's got resin in it, but it's not cured yet. So prepreg is the composite material itself.

So it's asking how many generations of prepreg. So that's a good question. Okay, you know, as I said, this pyramid of learning, the lower pyramid is when we look at all the coupons.

And certainly there is a multitude of composite materials out in the industry. It's which one is the right one to use. And that bottom pyramid that you do a lot of component testing on it -- coupon testing helps us sort out which one is right and which one is wrong, and why is one right and one wrong. You know, there's no free lunches, right. So as soon as you find something optimal, it's going to have a down side to it. So it's all the pros and cons of the different materials that can possibly be used in the jet engine, okay.

Q. Do you see other terms that relate to composite fan blades or --

A. Sure.

Q. -- fan blade containment systems?

A. Certainly. Fan blade, you know, fan casing here, right. I mean, that, again, composite fan blades, composite materials, right.

And, again, now that we are asking here for baseline value is used in the design A or B. Again, what's your down select. What's your criteria for down select. That's very important to short-circuit all that development. We talked about 10 to 15 years. Can I short-circuit that. Can I learn, you know, from other people what's good and what's bad. That certainly is big.

Software programs, you know, and virtual simulation,

that's one of our big things, right. I mean, we don't -- we certainly test, but we also build mathematical models to break those tests. And to build those mathematical models, to build that correlation of which models work, which ones don't work, how do I correlate to a test result using that simulation. Very, very important to short-cycle that design cycle, okay.

3-D braided structure. Again, that's another form of composite. That's one of our forms in our fan containment cases. That certainly is pointing towards that.

And then, you know, plus or minus 30 degrees. Now you are talking about specifics of construction. Again, fibers and resin, right. You know, you wrap your -- you wrap your cast around your arm, right, and if it's all one direction, that's great.

But the key thing about composites is orientation of fibers, right. So fiber -- fiber direction is very, very strong. But transverse, the other direction, it's just resin, right. So plaster of paris, I can break it, right.

So how I orient the fibers to optimize my load is kind of critical in composites. The orientation of the fibers, how you manufacture it, how you orientate the fibers to maximize, again, my strength to make the lightest design. That's key.

Q. Could discussion of the terms that you've highlighted

here, could discussion of these terms lead to discussion about information that GE tries to keep secret about composite fan blades and containment systems?

A. I would say that the discussions behind these would be, yes, be considered to be proprietary, and we would not -- we would not share that.

MS. GLATFELTER: If we could show the witness what's been admitted as Exhibit 6e.

And, again, if we look at the last page of Exhibit 6e. And publish that to the jury?

THE COURT: Yes, 6e.

MS. GLATFELTER: Thank you. One moment.

THE WITNESS: This doesn't look like --

MS. GLATFELTER: One moment, Your Honor.

THE COURT: Yes.

MS. GLATFELTER: Actually, I'm not sure we need to take a break or not, but I want to make sure I find the right exhibit.

THE COURT: I am prepared to take a break if it would be convenient.

MS. GLATFELTER: Yes. Thank you, Your Honor.

THE COURT: We will take a 20-minute break. During the break, take the break. Don't discuss the case among yourselves or with anyone else. No independent research. Continue to keep an open mind.

Out of respect for you, we'll rise as you leave.

THE COURTROOM DEPUTY: All rise for the jury.

(Jury out at 3:20 p.m.)

THE COURT: The jury has left the room. We're going to break 20 minutes, till 3:41.

During the break, sir, do not discuss your testimony, please.

We're in break until that time. When we come back, we will proceed. I'm going to need to stop abruptly by 4:25. We are in recess for 20 minutes.

THE COURTROOM DEPUTY: The court is now in recess.

(Recess from 3:21 p.m. until 3:39 p.m.)

THE COURT: We're back in the courtroom. Is there anything that requires my attention before we get the jury, from the government?

MS. GLATFELTER: No, Your Honor.

THE COURT: From the defense?

MR. McBRIDE: No, sir.

THE COURT: Forgive me. Are we now at cross-examination?

MS. GLATFELTER: No. I still have some more questions to go.

THE COURT: Very well. Let's call for the jury, please.

And the witness can retake the stand and be seated.

THE COURTROOM DEPUTY: All rise for the jury.

(Jury in at 3:41 p.m.)

THE COURT: You may all be seated. Thank you.

All 15 jurors are back. Thank you for your attention. We will continue to hear government questions of this witness.

You may proceed, counsel.

MS. GLATFELTER: Thank you.

Before the break, I had asked if the witness could be shown Exhibit 6e, and published to the jury because it's admitted.

THE COURT: 6e, we'll show it to everyone.

MS. GLATFELTER: Thank you. We're looking at the last page -- or the second page. Sorry.

BY MS. GLATFELTER:

Q. Mr. Kray, do you see that on your screen?

A. Yes, I do.

Q. And I want to go through the same exercise we did before. We're looking at this document. If you can tell us whether any of these terms relate to composite fan blade or composite containment system technology.

A. Certainly. So certainly we have obviously casing here, right. We are talking about materials, structure, and strength, right.

Q. Mr. Kray, I am going to ask you to pull the microphone closer to you so we can hear you while you are looking at the

screen.

Okay. Thank you.

A. So we have materials, structure, and strength, right. So, again, how we manufacture that blade and how we design it to optimize the strength, okay, is key.

Manufacturing. How you make the blade, right. So how you -- again, the fibers, how you assemble the fibers, orientations, et cetera, are all in that manufacturing.

This right here, design flow, ideas, principles, this guy right here (indicating), that's the whole process of, you know, how you actually go through the design process, how you -- what's your design principles, and how do you know one design's good and one is not.

And then demonstration, validation steps. We talked about the testing, right. That's all built into that validation.

Manufacturing, certainly that's -- that's key. Manufacturing of these products is, you know, you can design them, but if you can't make them, you're not going to have very good product, right. So it's all a balance of what can you manufacture. Can you manufacture it reliably every time, makes it a viable product.

And then implement it in engineering down here. The drawings, certainly that is very proprietary data. The drawing basically defines your design. The drawing is

03:44:34 essentially engineering's communication with manufacturing.
03:44:40 I can take a drawing, a physical drawing and give it to the
03:44:43 manufacturer and they can make that part. So the drawing
03:44:45 has a lot of information on it about the product.
03:44:49 And then experimental tests and process standards.
03:44:53 Again, all that learning that we go through, that 10 or 15
03:44:58 years of process steps: You know, how do you -- how do you
03:45:02 experimentally test it, how do you design a test such that
03:45:06 you can maximize your knowledge of that material system is
03:45:09 key.
03:45:09 **Q.** All right. And if we look at the top of the document,
03:45:13 and there are some terms there, are any of those terms
03:45:17 specific to composite fan blade?
03:45:19 **A.** Certainly. Material and size, right. That certainly
03:45:23 is key, right. I mean, what's the size of your blade. You
03:45:27 know, how big can you make it. What your thickness is.
03:45:31 Again, all of these not only play in performance from a
03:45:35 pumping air perspective but also from a credibility
03:45:42 perspective.
03:45:43 I think I know an aero guy, an aero design engineer
03:45:46 wants the air flow to be as thin as this sheet of paper, but
03:45:48 we know it's not going to survive, right. The first time it
03:45:52 hits a rock or a bird, it's going to break. So it's that
03:45:55 balance of size and definition of what works and what
03:45:59 doesn't work.

03:45:59 **Q.** And we see down in the middle of the page "A, B, reference, value, and confidential."

When you were describing the modeling and the software that you use before you go into actual component testing, could these terms relate to that?

03:46:17 **A.** Well, I don't know what it really means by A and B. It looks like it's some type of comparison. I don't know if it's been redacted out of here.

But, certainly, again, it's a trail on material systems, first of all, the material perspective, but also the analytical perspective. We talked about building analytical models to match testing, right. You like to do tests, but you also like to do analytical predictions so you can analytically iterate on design features and save yourself some testing. Certainly, you'll test at the end, but the more you can analytically understand the material system, the geometry of the blades or cases, the better off you are from a, you know, design cycle timing-wise. So if I understand it more mathematically, I can do simulations to a certain point. And then at some point I test. And either I validate those simulations or I go back and modify my simulations to say, I learned something new. I need to modify my understanding.

03:47:20 **Q.** Thank you. Now, these are general terms up on the screen that you've highlighted, right?

03:47:26 **A.** Yes.

03:47:27 **Q.** Could discussion of these terms by someone with knowledge of GE Aviation's composite fan blade and composite containment system lead to a discussion of secret GE information about those topics?

MR. McBRIDE: Objection. Calls for speculation.

THE COURT: Overruled.

You can answer the question. Do you need it again?

THE WITNESS: So the data behind this, yes, would be very proprietary for all the, you know, things we have highlighted here. That supporting data for those statements is certainly the meat of the proprietary nature of the composite blades and cases.

BY MS. GLATFELTER:

Q. Do you know someone by the name of David Zheng?

A. You mean Daihu?

Q. Daihu Zheng?

A. Yes, I know -- I actually knew him very well.

Q. Did you work together?

A. Yes.

Q. And on what?

A. So I first met Daihu when he worked at our Global Research Center in Niskayuna, New York. He was a research engineer there. He supported -- you know, we talked about the lineage of composite fan blades on GEnx fan blades. He

was supporting that analysis of those test predictions.

And then Daihu eventually moved to Evendale and supported the GE9x program, which is our latest composite fan blade case program, again doing analytical predictions and manufacturing integration of those products.

Q. And as someone working on those projects, did Mr. Zheng have access to design data, testing files, and other information that GE Aviation tries to keep secret?

A. Yes, he would, as being a part of those programs.

Q. Aside from those files themselves, would an engineer -- would he know public information -- I'm sorry. Let me strike that.

Aside from the files, would he know non-public information about GE fan blades and containment system technology that GE would not want shared with outsiders?

A. Yes, he would. Again, we talk about the building block approach, right. We're taking one design and leveraging it to another design, et cetera. He would obviously be integral with that, to help design the new designs.

Q. Mr. Kray, a few last questions about steps GE takes to protect information. Now, as an engineer, do you work on a GE campus?

A. Yes, I do.

Q. And can you briefly describe what kind of physical security measures, if any, exist around the areas where you

work?

A. So certainly there is card access to any building on GE -- in GE campus. Whether it's an off-site building or the main campus, you have card access. There is additional access. If you're in a, let's say, more secured area, you have a card and another pass code to get into the door. Certainly that's -- that's the first level of security from the access perspective, physical.

Q. And as an engineer at GE Aviation, have you been issued a laptop?

A. Yes, I have.

Q. Okay. And could you briefly describe some of the security measures surrounding that laptop?

A. Could you repeat the question?

Q. Sure. Do you have a GE Aviation laptop?

A. Yes, I do.

Q. Okay. And are there -- is there security around that laptop, for example, in the way that you log on or access files?

A. Yeah. We use what we call a two-factor, or two-factor authentication. The first one is you have your user ID, which is a code, and then you have a password associated with that. Okay, that's the first level.

The second level then they've gone to this chip where you have to insert a personal chip that you are -- that you

are given to access that computer.

Q. Okay. Are there security measures in what kind of design files and testing data about composite fan blades in terms of accessing the data?

A. So as far as our design practices and what I call design practices, which is, for example, when you -- when you do, for example, let's say the fan blade-out test, right. There'll be documentation of that. There will be analytical predictions of that.

We typically take that data, even in its entire or separate sections, and record it into what we call our design record books. This is electronic system internal in GE, which is a named access only. So to get access to those you have to again go through the password and key access to get electronic access to them. And then even the -- since composite blade is considered key technology, it's also named access. In other words, if I make design practice summary of a test, as owner of that design summary I would personally give access to person X, Y, or Z on a need-to-know basis.

Q. All right. And as an engineer working on the composite fan blade, if you wanted to present information about that subject, let's say, to -- publicly at a conference, what, if any, steps would you have to take at GE Aviation to do so?

A. Okay. So there's actually -- there's two steps you

have to go through. We have what we call design boards, which are -- which are focused boards of folks, technical experts, that are specific to a discipline.

For example, my design board is polymeric composites. That's a design board. There is a design board for turbines, turbo air flow, or dynamics, et cetera.

So your first step is to take your presentation draft to the design board. That would be reviewed then with the technical experts for release of information. You know, is it something we'd want to release to the public. Okay, that's the first step.

Once it goes through that iteration and say, yeah, the design board feels that the technical concept is acceptable to distribute, that package then goes to legal, and legal has a review of that information that also says from a legal perspective it's okay to present.

Q. And those are the steps that you're trained to go through if you wanted to discuss this technology outside of GE Aviation?

A. Yeah. Whether it's -- whether it's for advertisement purposes or if somebody wants to go to a symposium and present a paper, the same way.

MS. GLATFELTER: Just one moment, Your Honor.

(Pause.)

BY MS. GLATFELTER:

03:54:57 **Q.** When we were looking at 6e before, Mr. Kray, I forgot to
03:55:02 have you scroll down and look at the rest of the exhibit. And
03:55:06 I just wanted to do that before we end it.
03:55:08 We were looking at Exhibit 6e. As a reminder, whether
03:55:14 there were any types of words or terms on there about the
03:55:18 composite fan blade technology.
03:55:22 MS. GLATFELTER: And if we scroll down to the bottom
03:55:24 of that page, Ms. Prim.
03:55:24 BY MS. GLATFELTER:
03:55:32 **Q.** So I think we went through all the numbers except 3 or 4.
03:55:39 **A.** Yeah, so certainly -- certainly, materials, right. I
03:55:41 mean, material was used and how -- you know what material
03:55:43 are you using in your designs.
03:55:46 Production processes. Again, that's the manufacturing
03:55:48 method, right. How do you work with the material.
03:55:52 Material brands, you know, this is, we buy our material
03:55:56 from -- we don't make our own composite material. We'll buy
03:56:01 it. It's commercially available. So what brand names are
03:56:04 you using, right.
03:56:07 Standards. You know, all of our material we have
03:56:11 specifications and standards. You know, if you go to buy,
03:56:16 let's say, anything from a manufacturer, they are going to
03:56:21 have their advertisement of how great their material is,
03:56:23 right. Certainly, we take that with a grain of salt. We
03:56:26 don't really believe it. I mean, we actually do our own

testing to say, yeah, it's right or maybe it's not really exactly right. It's a good advertisement article, but it's not -- for our needs it's not adequate.

So what we typically do is once we understand a material, we write our own specifications and our own standards to say if we are going to ship me that material to make a composite fan blade, you have to meet these specifications or I'm not going to accept the material, because I know that my assumptions for strength and durability rely on these specifications of material.

Performance parameters. Certainly, how well -- how well does the material perform. Not only from a strength perspective but the fan blade from a -- from an overall pumping air, right. The main thing is the fan blade is going to pump air. And that's its whole purpose in life is to pump air. If it does pump air very well, and how does it deflect the load. Those are all reason for performance. Again, highest performing engine is what we're trying to achieve.

And then, obviously, test data. You know we talked about test data, right. That's very important.

Q. And before when we stopped, when we ended our discussion of this exhibit, I had asked you do discussion of these terms, discussion of these new terms lead to discussion of GE's secret information about composite fan blades and containment

systems?

A. Certainly. All the material behind those terms is, is what we're trying to protect.

Q. For example, the specifications that you were mentioning before, is that one of the things that GE doesn't share with the public or competitors?

A. We do not share with our competitors. We share with our suppliers, right. When we buy material, we say you have to meet this specification, and they obviously -- obviously have witness to that.

Q. And the test data is another example?

A. Yes.

Q. Thank you.

MS. GLATFELTER: No further questions.

THE COURT: The lawyer for the defendant has an opportunity to ask questions of you at this time.

Cross-examination. We're going to break abruptly at 4:25.

MR. McBRIDE: Yes, sir.

CROSS-EXAMINATION

BY MR. McBRIDE:

Q. Good afternoon, Mr. Kray. How are you today?

A. I'm very good. How are you?

Q. Good, thank you. My name is Bob McBride, and I am one of the lawyers that represent Mr. Xu today in this case.

03:58:53 One of the things that I believe you testified about was
03:58:57 it was important to have safe vehicles and safe products for
03:59:02 FAA certification, correct?
03:59:04 **A.** Well, that is correct, but not only from a
03:59:08 certification perspective but from, you know, the overall
03:59:16 design, right. I mean, we can meet certification
03:59:19 requirements, but over and above that we want to make sure
03:59:24 it's safe.
03:59:24 **Q.** Absolutely. Because people's lives are at stake.
03:59:25 **A.** Certainly.
03:59:26 **Q.** Absolutely. And I'm not contesting that in any way,
03:59:30 shape, or form.
03:59:33 I am going to try to go backwards a little bit here if I
03:59:35 could. I believe you testified earlier that in order for a
03:59:39 presentation to be made it had to be cleared by a board,
03:59:45 correct?
03:59:45 **A.** Correct.
03:59:46 **Q.** And cleared by legal, correct? So there are some
03:59:50 instances then when there are presentations made that show GE
03:59:54 images, correct?
03:59:55 **A.** That's correct.
03:59:57 **Q.** Are you aware if any of those kinds of presentations
03:59:59 include composite -- jet engine with composite fan blades and
04:00:06 housings?
04:00:06 **A.** Well, certainly the picture we just looked at, right.

04:00:10 I mean, that's a general picture of a composite blade
04:00:13 encased. That's certainly a public -- a public figure.
04:00:16 **Q.** And, in fact, let me ask this question. Have you looked
04:00:21 at the Safran website regarding the LEAP engine?
04:00:25 **A.** Can you repeat your question?
04:00:27 **Q.** Have you looked at Safran's website -- pardon me -- CFM
04:00:34 International's website?
04:00:35 **A.** I may have looked at it once or twice, I'm sure.
04:00:38 **Q.** Seen the images of a LEAP engine there?
04:00:40 **A.** Sure, sure.
04:00:41 **Q.** So the technology itself or the fact that there are
04:00:45 composite -- let me rephrase. The fact that there are
04:00:48 composite fan blades and containment housings in and of itself
04:00:51 is not a secret that GE wants to keep?
04:00:58 **A.** I think the fact that composites are out in industry is
04:01:01 something we want to promote because it is our commercial
04:01:05 advantage. Now, how to make those certainly is something we
04:01:09 want to protect.
04:01:10 **Q.** I understand. But these vehicles -- pardon me. These
04:01:13 jet engines are sold all over the world; is that correct?
04:01:15 **A.** That is correct.
04:01:16 **Q.** In fact, it's one of GE's best selling products in terms
04:01:20 of jet engines, is it not?
04:01:22 **A.** That is correct.
04:01:24 **Q.** And that's because it is a more durable and lighter jet

engine you can build?

A. Correct.

Q. And that makes it easier to make a larger and lighter aircraft too?

A. That's -- that is our goal, yes.

Q. Very generally.

A. Yes.

Q. Obviously, I don't have the technical knowledge.

One of the things I believe you just talked about, sir, was buying the materials. You will get specifications from various vendors; is that correct?

A. So we -- we get specifications from a supplier of a very general nature. Okay. Now, certainly, they like to sell their product, right, so they'll say how great it is. Again, we -- we take that as a first step.

Second step is we go and validate. You know, there is no perfect world, right. So we make sure that what they say is true and house, you know -- if I have a manufacturing material that's balanced on a pin of a head, right, which is sometimes what they'll try to sell --

Q. Um-hmm.

A. -- as soon as they deviate on their material from one way or the other, it has a big debit. And that's what we try to understand when we put specifications in. If I say that I manufacture our material at, let's say, 200 degrees,

for example, I manufacture my prepreg at 200 degrees. If I manufactured it at 205 degrees, are my properties consistent or do they fall off?

So, again, understanding that when we call design space around the -- all the products, whether it's material or even the design itself, is critical.

Q. So the consistency of the material, particularly the fibers, is important in the ceramic matrix design and manufacturing process, is it not?

A. So ceramic matrix is a little different.

Q. Metric. Pardon me.

A. So we talk about polymeric matrix, right. Ceramic matrix is, again, it's a composite but it's in the back of the engine. It's a very, very high temperature capability. That's not in the fan.

The polymeric, which is epoxy-based composites, are what we are dealing with here.

Q. My apologies. I meant polymetric composite.

But in the design and manufacturing of the polymetric components, it's very important to have a consistent and stable fiber, is it not, that you start with?

A. That is correct.

Q. And if you were to start the design process with a different fiber, that would impact the entire cycle design, manufacturing process cycle, would it not?

04:04:01 **A.** It would -- you would have to go back and repeat a lot
04:04:05 of that characterization to understand that material just as
04:04:09 well, yes.
04:04:09 **Q.** And, in fact, it would impact the computer modeling
04:04:12 codes --
04:04:12 **A.** Certainly.
04:04:13 **Q.** -- would it not?
04:04:14 **A.** Certainly.
04:04:14 **Q.** So even a change as minor as a fiber can impact the
04:04:18 entire design-build process, correct?
04:04:22 **A.** Yes. Whether it's fiber size, fiber direction, even --
04:04:27 even the supplier of the fiber. You know, whether I buy it
04:04:31 from Company A or Company B, fiber is not always fiber,
04:04:35 right. You have to make sure that you understand that
04:04:37 potential subtle difference which could make a big
04:04:41 difference in design, yes.
04:04:42 **Q.** So were one to hypothetically try to replicate GE's
04:04:46 process, they would have to know exactly the fiber you buy and
04:04:53 exactly the tests you need and what the tolerances are that
04:04:56 you evaluate it at; is that correct?
04:04:59 **A.** I would say that's correct.
04:05:00 **Q.** You spoke, sir, about coupon testing and component
04:05:10 testing.
04:05:10 **A.** Um-hmm.
04:05:11 **Q.** What is that general process called?

04:05:14 **A.** Well, again, I don't know if you'd really call it a
04:05:20 process. We call it the hierarchy of learning, the pyramid
04:05:24 of learning, right. So the very basic level when you're
04:05:27 trying to sort out, let's say, again when you talked about
04:05:31 fiber size and parameters, right. It's sorting out, you
04:05:35 know, material A versus material B verses resin A versus
04:05:40 resin B and a combination thereof. All that gets done at
04:05:43 the very basic level, which is you can go through a lot of
04:05:48 coupons rather quickly versus trying to build the parts and
04:05:52 build tooling and test parts, yes, sir.
04:05:55 **Q.** So is this process generally known as the building block
04:05:59 process?
04:06:00 **A.** That is correct.
04:06:00 **Q.** And so the building block process is well-known in the
04:06:06 industry for making composites, correct?
04:06:09 **A.** That is true, yes.
04:06:10 **Q.** So if I wanted to make a composite flying pig, I may want
04:06:13 to use the building block process, correct?
04:06:16 **A.** You can make golf shafts or whatever, sure.
04:06:19 **Q.** So almost anything made of composites will use this
04:06:22 building block process; is that fair?
04:06:26 **A.** Typically, that's -- that's the industry standard, yes.
04:06:29 **Q.** And within the building block process, the industry
04:06:32 standards that you have mentioned is to start with the coupon
04:06:35 test, correct?

A. That's correct.

Q. And the coupon test -- and correct me if I'm wrong, sir -- is a very tiny bit of material when you begin the testing, correct?

A. It is limited in size. The coupons are typically, you know, on the order of an inch by a couple inches. It's rather small material.

Q. Relative to the size of the fan blades and --

A. Oh, yes.

Q. -- the fan case, they are pretty small, aren't they, sir?

A. Yes.

Q. So -- and the purpose of this is you will take a coupon with the fibers and the epoxy and you will test it for its performance, correct?

A. Correct.

Q. And that performance is in terms of stretching the material, correct?

A. It's -- it's stretching. It's twisting. You know, you build up internal shears. It's fatigue. Again, the paper clip, how many times can I bend it back and forth before it breaks. All that -- all that type of basic, I am going to call it basic testing, yes.

Q. So just for point of reference, the shear that you mentioned, sir, is shearing of the layers of the coupon; is that correct?

04:07:37 **A.** That's correct.

04:07:38 **Q.** And then as I understand the process -- and my view is very simple -- you will then put components together, coupons together, and test larger pieces of the coupon test?

04:07:51 **A.** Yeah. You'll -- you'll go from a coupon testing up to basically then you might have some specific feature testing, right.

04:07:58 So let's talk about composite fan blade, for example. The retention system, how I hold it in a disk. I may test only that feature in a -- in a static type of pole test just to understand how those shears and capabilities work together when I go from a coupon level to a more complex, multi -- multilayer or composite construction that might be similar to the architecture of my proposed design.

04:08:31 **Q.** So you are basically going from the bottom up, and you have --

04:08:31 **A.** Right.

04:08:34 **Q.** And you have a -- you have coupons large enough, and then at some point you are going to want to get to do some more sophisticated testing, correct?

04:08:41 **A.** Correct.

04:08:41 **Q.** So, for instance, you were mentioning a more complex geometric shape that you might want to test, like a bend in a blade, correct, sir?

04:08:51 **A.** Correct.

04:08:52 **Q.** Is that fair?

04:08:53 **A.** Sure.

04:08:53 **Q.** And there are also other tests that you do. You, like, punch a whole in a block of coupons and test how that reacts when you pull it, correct?

04:09:01 **A.** Yeah. Damage -- we typically call that damaged tolerance. We will intentionally put damage in the material and see how it reacts. Again, you know, safety, right. If I --

04:09:11 **Q.** Sure.

04:09:12 **A.** -- pick up a rock off the runway, it hits a composite part, does damage. The aircraft's in the air. Is it going to propagate and cause more damage? I want to know that ahead of time.

04:09:23 **Q.** Absolutely. So each piece that you test, you essentially test it to destruction of that coupon or component, correct?

04:09:30 **A.** Typically to destruction, yeah. We want to know the thresholds. Certainly, what I'm going to call the elastic portion. You know, how much it bends and deforms under -- just on the elastic load.

And then ultimate load. How it breaks. What is the failure mode. Does it -- does it split apart or do the fibers break.

All that understanding is critical to take it to the next level of actual component design.

04:09:59 **Q.** And as I understand it, with the results of this
04:10:03 destructive test, whichever type it is, you will then do a
04:10:06 modeling, a computer modeling for the next?
04:10:09 **A.** That's right. That's correct. We try to -- we try to
04:10:13 build these computer models, simulations, to again capture
04:10:18 that capability because, again, if we can use that
04:10:23 understanding to drive the design at the next level higher,
04:10:28 which is the blade level or the case level, that certainly
04:10:32 will help us, you know, shorten that design cycle and get a
04:10:36 little bit of learning, yes.
04:10:38 **Q.** And the program -- correct me if I'm wrong about this --
04:10:42 that GE generally uses is LS Dyna, correct?
04:10:45 **A.** That's correct. That is a commercial code. It's
04:10:48 available across the board. But it's like -- it's a very,
04:10:52 I'm going to call it, open architectural program.
04:10:54 **Q.** Um-hmm.
04:10:57 **A.** So you need to put in your material, I'm going to call
04:11:01 it material models, your material understanding. And let's
04:11:05 say a typical composite material model may have 15 or 20
04:11:13 constants to have to be put into that computer language so
04:11:16 it understands how it breaks under tension, compression,
04:11:19 shear, all right. And all those constants are derived off a
04:11:24 coupon testing.
04:11:25 **Q.** Sure.
04:11:26 **A.** And feeds into the overall material model.

So, yeah, Dyna is a very generic code. It's very -- you don't buy it with composite material properties in it, right. You have got to put those in yourself.

Q. Understood. But there are other similar programs out there that are commercially available?

A. Oh, sure. There is Abacus, there is Dytran, there is Dyna. You know, again, it's user preference. We have built -- basically over the last probably 15, 20 years maybe, Dyna has been our choice of software. We've used others before that, but it looks likes Dyna is becoming the industry standard.

Q. So within the modeling process and the computer model generation, that's all based on what I will call trial-and-error testing that you have done in the past?

A. Yeah. So as I might have mentioned earlier, that builds your basic understanding, builds your constants for materials.

Now, as you get into, let's say -- let's take it to the next level up. A bird ingestion, for example. I use that model, that computer simulation code to predict what might happen when a bird hits --

Q. Right.

A. -- the airfoil. I predict it. I adjust my thicknesses. I kind of optimize my design to make it work. At least on the computer it works. And then I do a test.

04:12:56 And the test may come back and say, yes, your prediction is
04:12:59 good. So you go to the next level. If it's not good, I
04:13:03 need to go back and understand why and adjust my material
04:13:08 assumptions or my material model of why it didn't work
04:13:11 because I certainly need to understand that to make my
04:13:23 efficient design.
04:13:24 **Q.** Let me follow on with -- and I think this is what you're
04:13:27 saying, sir -- is that to a certain degree building a
04:13:29 polymetric composite component part is dependent on the
04:13:35 in-house processes?
04:13:36 **A.** I would say it's built on the learnings, yes. Again,
04:13:41 you are leveraging a building block. And in our case, since
04:13:44 we are on, what I will call, almost our fifth generation of
04:13:48 composite families, is building upon the hierarchy of those
04:13:52 generations.
04:13:52 **Q.** So let me run down a list of things that I want to ask
04:13:55 you if they're significant.
04:13:57 **A.** Um-hmm.
04:13:57 **Q.** So I think you've already talked about a knowledge base
04:14:00 regarding your design; is that correct?
04:14:02 **A.** Could you repeat that again?
04:14:04 **Q.** So the company's knowledge base --
04:14:05 **A.** Yes.
04:14:05 **Q.** -- and the design --
04:14:05 **A.** Yes.

04:14:07 **Q.** -- is an important thing, and that's all in-house, correct?
04:14:09 **A.** Yes.
04:14:09 **Q.** And then the preferences regarding the modeling codes we just talked about, correct?
04:14:12 **A.** Correct.
04:14:14 **Q.** Something that GE develops over time, correct?
04:14:15 And then the in-house guidelines you might have for the product itself, correct?
04:14:20 **A.** Yeah. And we talk in-house guidelines, it's, okay, what kind of stress levels can I live with for either fatigue, right, my bending, my -- you know, go back to my paper clip. You know, how much, how much bending can I do to make sure it fatigues right. All that is kind of built into that learning.
04:14:25 **Q.** Right. And then the manufacturing expertise and limitations, that's an important component, correct?
04:14:43 **A.** Certainly manufacturing because, again, if you manufacture on the pin of a head, you need to understand any deviation to that manufacturing so I don't put a product out the door that I assume is this capable and it's only this capable (indicating).
04:14:48 **Q.** I'm not looking at my watch because I am concerned about your testimony. I want to make sure I don't blow the judge's timeline.
04:14:52
04:14:56
04:14:59
04:15:03
04:15:04
04:15:08
04:15:11

THE COURT: I'll take care of that.

MR. McBRIDE: Thank you.

BY MR. McBRIDE:

Q. And GE, of course, is a global manufacturer and has -- tell me if this is fair -- compared to most of its competitors, huge personnel and financial resources to develop technology, correct?

A. Yeah, I would say. You know, when you look at jet engines, right, you've got three main players and maybe a couple smaller players. You've got GE, Pratt & Whitney, and Rolls-Royce are the three main players in the industry.

And you have Safran and Honeywell, which I want to call it -- are also players but probably not as big as the top three.

Q. So I believe you told us that the building block is a -- building block approach is a basic way to building component structures, sir; is that correct?

A. The building block understanding, yes.

Q. And this is essentially the process that General Electric has -- GE Aviation has used in building its components, polymetric component fan blades and housings, correct?

A. I would say yes.

Q. And it could -- and other organizations, if they spent the time and the money, could also build polymetric fan blades and housing using the same basic method, correct?

04:16:37 **A.** I would say that is correct, but others have tried and
04:16:42 not succeeded.
04:16:46 **Q.** Well, you mentioned Rolls-Royce. I believe in the '80s,
04:16:50 sir, it almost went bankrupt. Is that what you said?
04:16:52 **A.** Yes.
04:16:53 **Q.** In the '80s, I think you would agree with me that
04:16:56 computer capabilities were not quite what they are today.
04:17:00 **A.** I would a hundred percent agree.
04:17:05 **Q.** And so that certainly might have been a factor in the
04:17:07 problems that Rolls-Royce had in creating the --
04:17:11 **A.** Yes, that is true, but our competitors still don't have
04:17:16 composite blades. And the funny thing is they have metallic
04:17:21 blades and they paint them to look like composite blades.
04:17:24 **Q.** So you are telling me that Rolls-Royce UltraFan's engines
04:17:28 do not have composite fan blades?
04:17:30 **A.** They are touting that it does, but it is not certified.
04:17:33 **Q.** Well, that doesn't mean it is not a composite fan blade,
04:17:36 though, does it?
04:17:37 **A.** It can look good on a shelf, but it doesn't fly yet.
04:17:41 **Q.** That doesn't mean it's not a composite fan blade, does
04:17:44 it, sir?
04:17:45 **A.** It's a composite fan blade.
04:17:47 **Q.** All right. Would you agree with me also that it takes a
04:17:52 lot of institutional resolve to develop this kind of product?
04:17:57 **A.** I think it takes a lot of dedication, certainly. I

mean, we talked 10 to 15 years of development process to do that, and that's with a large team working on it. Not only design but materials, certification, testing. It's -- it's several. I will say a hundred people.

Q. But you would agree with me that were another organization to have those skills, likes Rolls-Royce, they could develop composite fan blades and housings?

A. I guess it's feasible.

Q. Thank you, sir. Those are all the questions I have.

THE COURT: Very well. Is there redirect of this witness?

MS. GLATFELTER: No, Your Honor.

THE COURT: Very well. Sir, your testimony is complete and you have appeared to have survived, and you are free to go.

THE WITNESS: Thank you, sir.

THE COURT: Very well. Ladies and gentlemen of the jury, we are going to break for the day. I have something at 4:30 I need to attend to in another case. We've had a big day, and I've been watching. You are paying close attention. And on behalf of the Court and the community, we appreciate your hard work.

During the break tonight, take a break. We'll need you back by 9:15 in the hopes we can get you in the courtroom at 9:30. During the break, do not discuss the case with anyone,

including among yourselves. No independent research. Continue to keep an open mind.

Out of respect for you, we will rise as you leave for the day.

THE COURTROOM DEPUTY: All rise for the jury.

(Jury out at 4:19 p.m.)

THE COURT: The jury has left the room. The door is closing. Is there anything that requires the Court's attention before we recess for the day? From the government's perspective?

MS. GLATFELTER: No, Your Honor. Thank you.

THE COURT: From the defense?

MR. McBRIDE: No, Your Honor. Thank you.

THE COURT: Very well. Enjoy the evening, although I know you won't. I will see you at 9:30, I hope.

THE COURTROOM DEPUTY: The court is now in recess.

(Proceedings adjourned at 4:20 p.m.)

CERTIFICATE OF REPORTER

I, Mary A. Schweinhagen, Federal Official Realtime Court Reporter, in and for the United States District Court for the Southern District of Ohio, do hereby certify that pursuant to Section 753, Title 28, United States Code that the foregoing is a true and correct transcript of the stenographically reported proceedings held in the above-entitled matter and that the transcript page format is in conformance with the regulations of the Judicial Conference of the United States.

s/Mary A. Schweinhagen

_____ 21st of January, 2022

MARY A. SCHWEINHAGEN, RDR, CRR
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